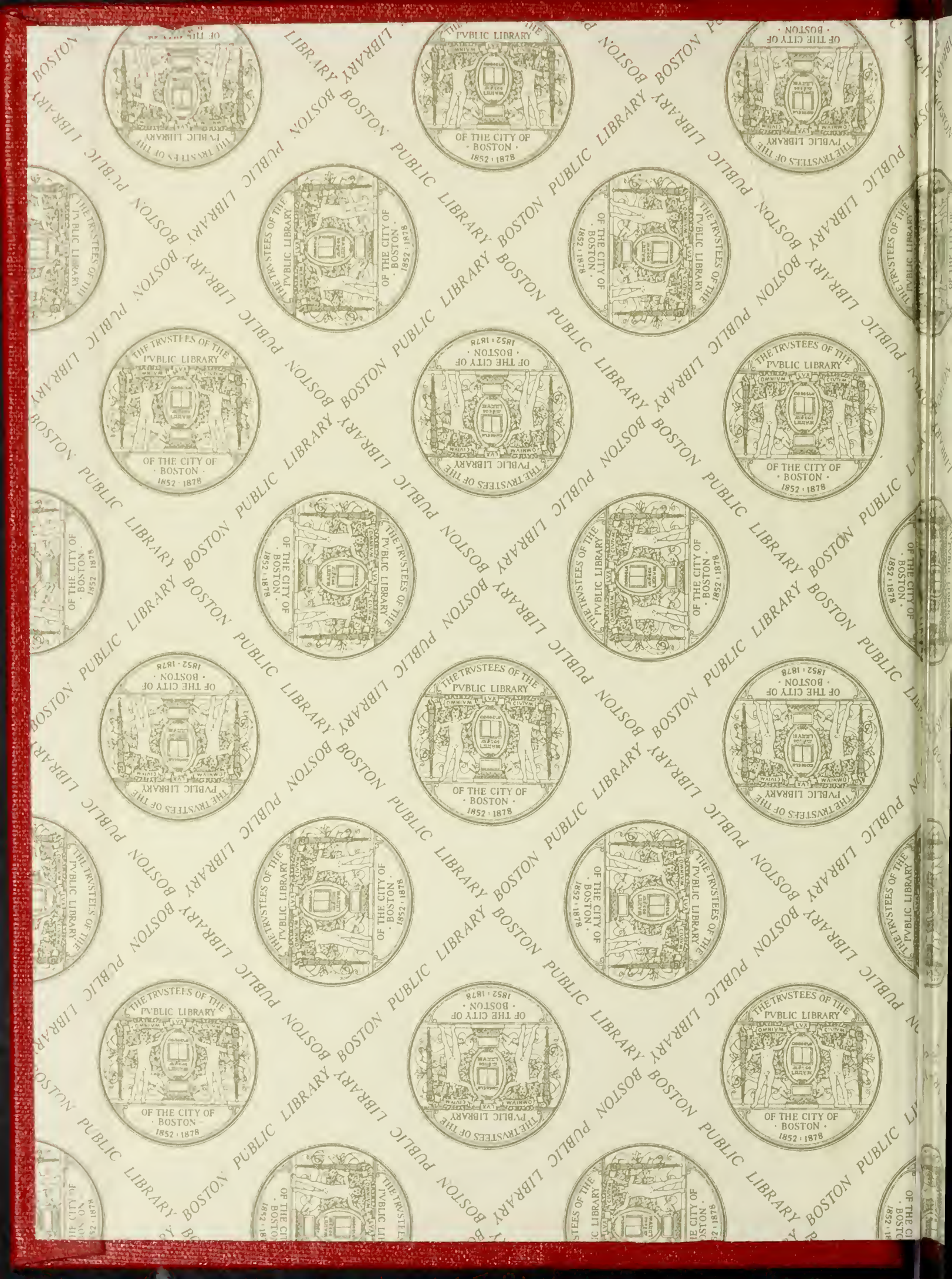


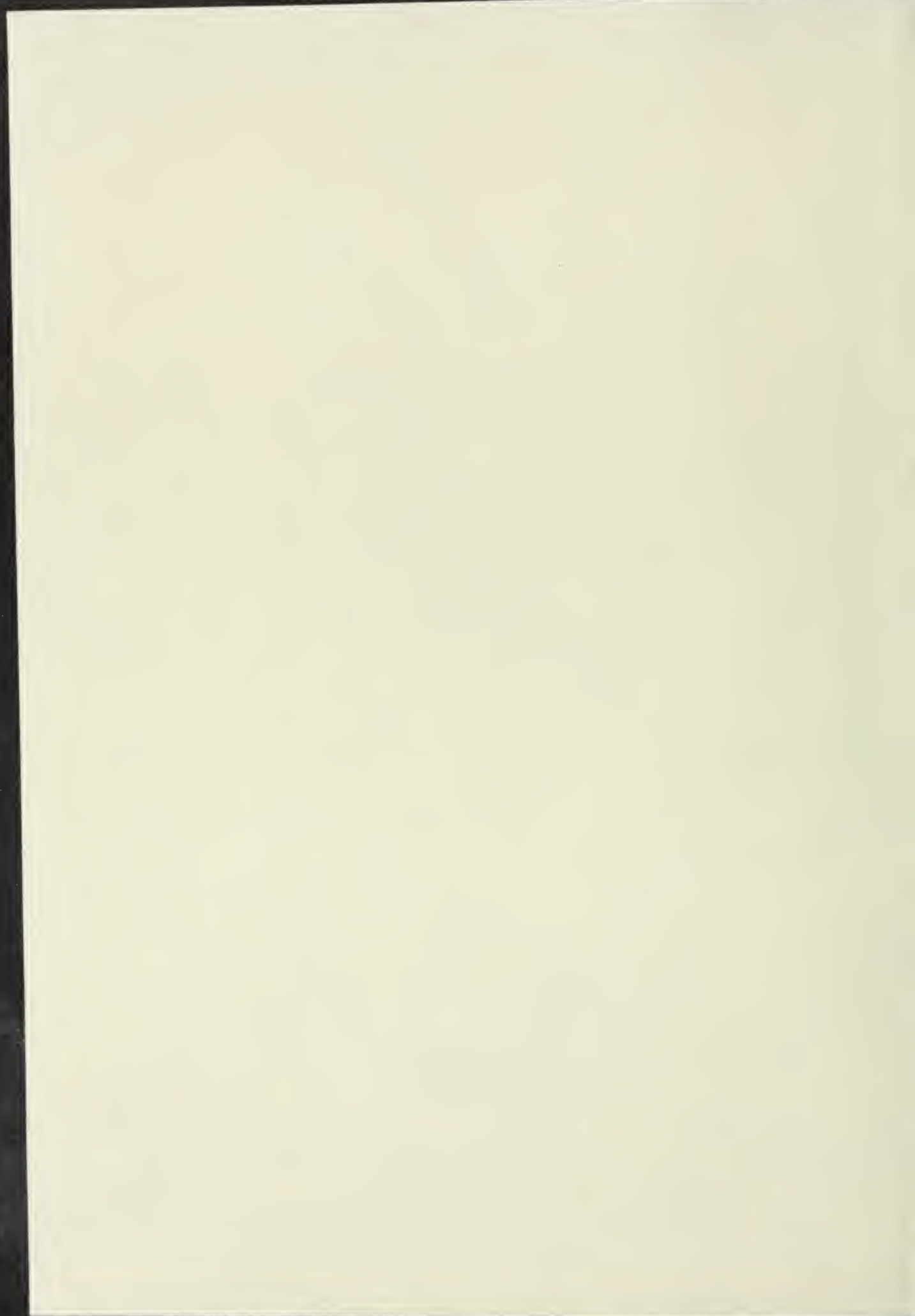
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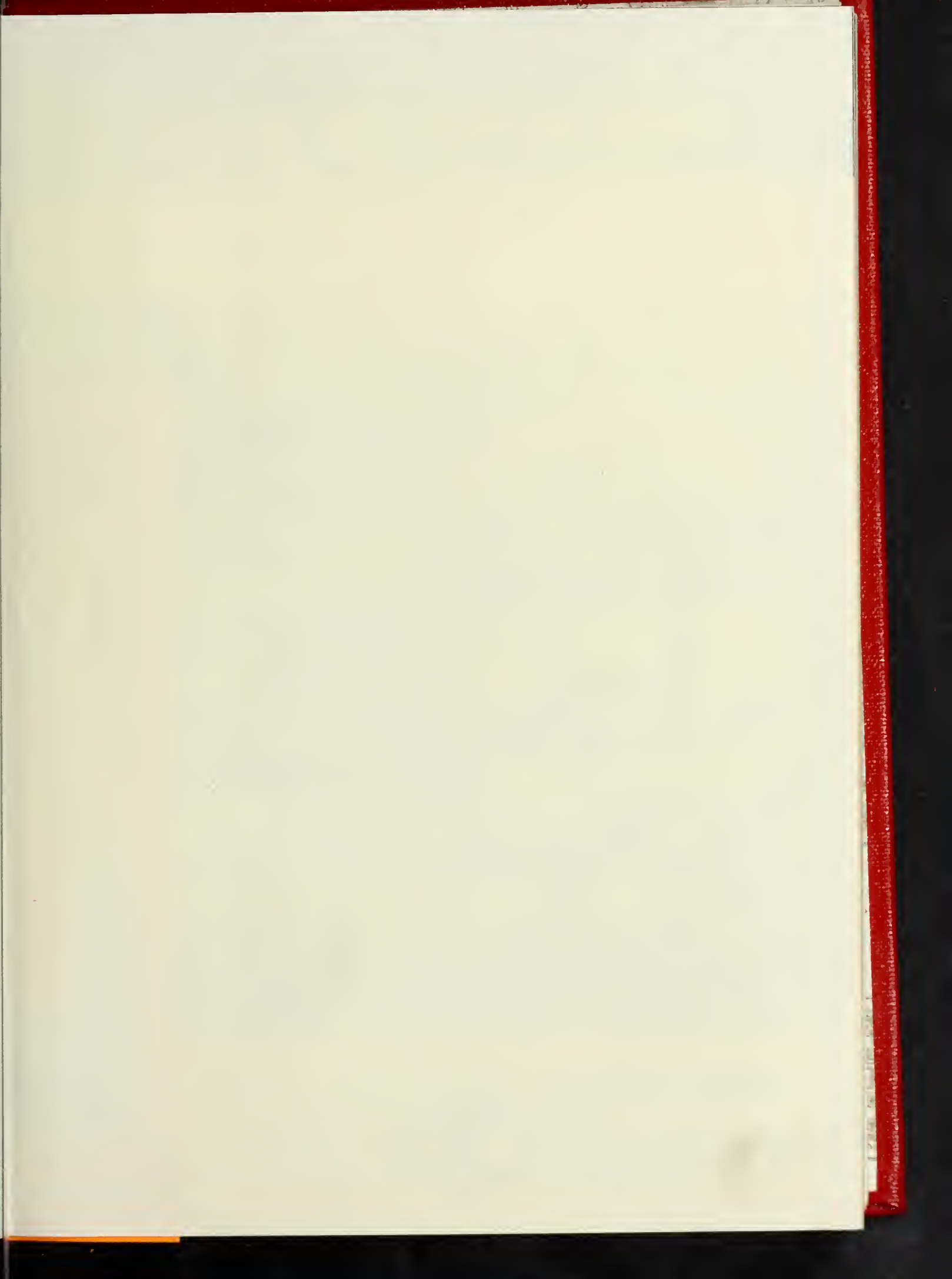


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**Massachusetts Bay
Transportation Authority**
Ten Park Plaza
Boston, Massachusetts 02116

BMA 1034



Massachusetts Bay Transportation Authority

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4491
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987

In what has been described as one of the T's finest hours, the transition of Orange Line operation from the old "EL" to the Southwest Corridor would not have been possible without the skill, professionalism, and sensitivity to the public of thousands of T employees.



1987

Statistical profile

1987

Average weekday ridership

All systems	642,251
Basic T system (estimated)	587,942
Commuter rail	52,372

Number of active vehicles

Buses	1,162
-------	-------

Streetcars

(12 PCC's, 160 LRV's), total fleet	172
Rapid transit cars, total fleet	352
Trackless trolleys	50

Commuter rail

(43 locomotives, 168 coaches)	203
-------------------------------	-----

Specially equipped vans	87
-------------------------	----

Number of stations/stops

Rapid transit	117
Commuter rail	97

Number of routes

Bus	157
Rapid transit (Red, Orange, Blue Lines)	3
Streetcar (Green Line)	5
Trackless trolley	4
Commuter rail	11

Number of route miles (one-way)

Bus	700
Rapid transit	47
Streetcar	35
Trackless trolley	16
Commuter rail	259

District member cities and towns

	78
--	----

Size of service area (square miles)

	1,038
--	-------

Population in service district (1980)

	2,608,638
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James O'Leary was appointed General Manager of the Massachusetts Bay Transportation Authority (MBTA) in 1981. He was reappointed by the Board of Directors in 1984.

Mr. O'Leary, 38, was named General Manager of the MBTA after serving two years as Undersecretary and General Counsel of the Executive Office of Transportation and Construction. He came to EOTC after serving as Legal Counsel to U.S. Representative John Joseph Moakley. A graduate of the University of Massachusetts at Boston,

Mr. O'Leary earned his Juris Doctor degree from Suffolk University in 1973. He is a two-time winner of the Federal Urban Mass Transportation Administration's Outstanding Public Service Award.

Letter from the General Manager

Nineteen eighty seven will be remembered in MBTA history as the completion date for many long-term construction projects and vehicle acquisition programs, including the 4.7 mile Southwest Corridor Orange Line relocation project. The completion of these programs sets the stage for the MBTA to meet demand for additional public transportation services in the years ahead. They also mark the MBTA's emergence as one of the most modern and efficient transit systems in the country.

Significantly, signs show that ridership continues to increase at levels above the national norm, that crime on the MBTA is being contained through tough and efficient police work, that passengers approve of service and safety on the system in ever-increasing numbers, and that the morale and professionalism of MBTA employees is at an all-time high.

The Southwest Corridor Orange Line project, at \$743 million and the largest construction project in the history of Massachusetts, was completed on-time and within budget, and opened for passenger service on May 4. Minority and female business participation on this project reached over 16 percent, surpassing state and federal goals. Reconstruction of the Needham Branch of the Commuter Rail system was completed and the line went back into operation in October of 1987.

To meet increased ridership demands head-on, our modernization and vehicle acquisition agenda went into high gear in 1987. The first of ten Red and Orange line stations renovated under our \$80 million Station Modernization program came on-line. Extended platforms allowed the start of six-car operation on the Orange Line in September, with plans to extend six-car operation to the Red Line early in 1988. Revenue service miles increased to new highs.

The first 70 of a total order of 107 commuter rail coaches, and 26 locomotives went into service, as well as the first of 58 new Red Line cars. New Green Line streetcars continued to be placed in service.

In 1987, reported crimes on the Massachusetts Bay Transportation Authority hit a ten-year low, and the professionalism of the nationally-accredited MBTA Police Department was recognized by Governor Michael Dukakis as being the prime reason for this significant improvement in personal safety.

Governor Dukakis, stressing the importance of an efficient and well-run public transportation system to the Commonwealth's booming economy, filed legislation in 1987 which would provide over \$800 million for further capital improvements during fiscal years 1988 and 1989 on the MBTA.

One of the biggest challenges facing the Authority is preparing for approximately 150,000 additional passengers expected to use public transportation during the depression of the Central Artery and construction of the Third Harbor Tunnel. Finding areas to increase parking—such as the new 1,000-car lots planned for Lynn and Saugus—has become a priority for the MBTA. Plans call for the creation of 10,000 new parking spaces over the next five years.

The nation's oldest subway system is becoming one of the newest. The region's growing economy, as well as the environment, depend on public transportation, and the MBTA is well on its way toward fulfilling these critical roles through responsible fiscal management, clear, futuristic planning and efficient operations. I am proud of the job being done day in and day out by everyone at the Authority.

James F. O'Leary

Forest Hills Station, end of the Orange Line and a 15 minute ride from downtown Boston, is the transfer point for feeder bus routes serving surrounding residential communities. The station plays an integral role in helping to transport the workforce that fuels the region's economic growth.



Forest Hills Station was the site for the May 2 Southwest Corridor opening ceremonies, celebrated by local residents, elected officials and T workers. Joining in the ribbon cutting ceremonies were Governor Michael S. Dukakis, Congressman J. Joseph Moakley, Secretary of Transportation and Construction Frederick P.

Salvucci, General Manager James F. O'Leary, Mayor Raymond L. Flynn, MBTA Board members and other federal, state and local officials.



Highlights of 1987

The new Southwest Corridor Orange Line, the largest construction project in Massachusetts history, opened May 4th after nine years of construction and over one thousand community meetings.

Attleboro, Stoughton and Franklin commuter rail and Amtrak intercity service began operating through the Southwest Corridor in early October. Service began through Dorchester on the new Fairmount Line.

The rehabilitated Needham Line began service in mid-October, serving Needham, West Roxbury, Roslindale, and Boston's Back Bay and South stations.

A fifty-two acre park, adjacent to and above the new Orange Line, was completed; the first major addition to the region's park system in fifty years.

Revenue miles of service increased by 6 percent, to 44.1 million miles per year. Average daily ridership increased by about 4 percent, from 566,400 to 587,900.

The Ride program was expanded to Quincy, Braintree, Milton, and Weymouth in the south; Lynn, Salem, Swampscott, Nahant, Saugus, and Marblehead in the north; and to Framingham and Natick in the west. The program now serves 24 communities, with further expansion planned for 1988.

Serious crime on the MBTA reached the lowest level in a decade, dropping 18-percent between 1986 and 1987.

The first of fifty-eight new rapid transit cars were put into service on the Red Line.

The remaining fifty of one hundred Type-7 streetcars for the Green Line began to arrive.

Eighteen of twenty-six locomotives and seventy of one hundred seven coaches were put into service on the commuter rail system.

The final ninety of three hundred eighty advanced design buses (GM-RTS) were put into service.

The seventy-four car Red Line Silverbird Rebuild program reached its final stages.

The Red Line Track Reconstruction Project is progressing rapidly between Charles and South stations; an earlier phase of the project was completed between Charles and Harvard.

The Green Line Track Reconstruction Project continued between Copley and the tunnel portals of Arborway, Riverside, Cleveland Circle, and Boston College lines.

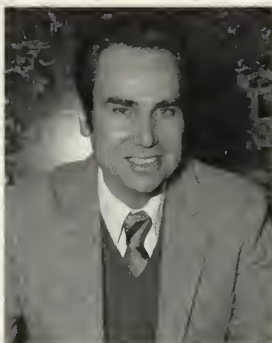
Orange Line platform lengthening was completed, allowing the operation of six-car trains in September. This allowed Orange Line peak period capacity to increase by 50 percent.

The modernization of Kendall Station was completed—the first of ten stations included in the MBTA's \$80 million Station Modernization/Platform Lengthening project. Six-car Red Line operation is planned for early 1988.

Construction of the South Station Transportation Center continued, with operation beginning on new high-level commuter rail platforms.

Construction began on new commuter rail stations and parking facilities in Lynn, Forge Park/Franklin, and South Attleboro.

The MBTA Board of Directors is a seven member organization appointed by the Governor to serve coterminously with the Governor.



Frederick P. Salvucci

Chairman of the Board. The Chairman of the Board also serves as Secretary of the Executive Office of Transportation and Construction.



William F. Irvin

**International Sub District
Director, United Steel
Workers of America; Vice
President of Mass. AFL-CIO;
actively involved in organized
labor since 1950. Resides in
Melrose.**



Judith H. Robbins

Attleboro City Council
President and professional
public administrator; MA
BA from Stanford University
and MPA from Suffolk
University.

The MBTA, established by the Legislature in 1964, is composed of 78 member communities.





James E. Smith

Lynn attorney and graduate of Harvard University's John F. Kennedy School of Government; former Executive Director of MBTA's Advisory Board; former member of Mass. General Court.



Melissa A. Tillman

Former director, National Association of Realtors; former assessor of Town of Longmeadow. Resident of Springfield.



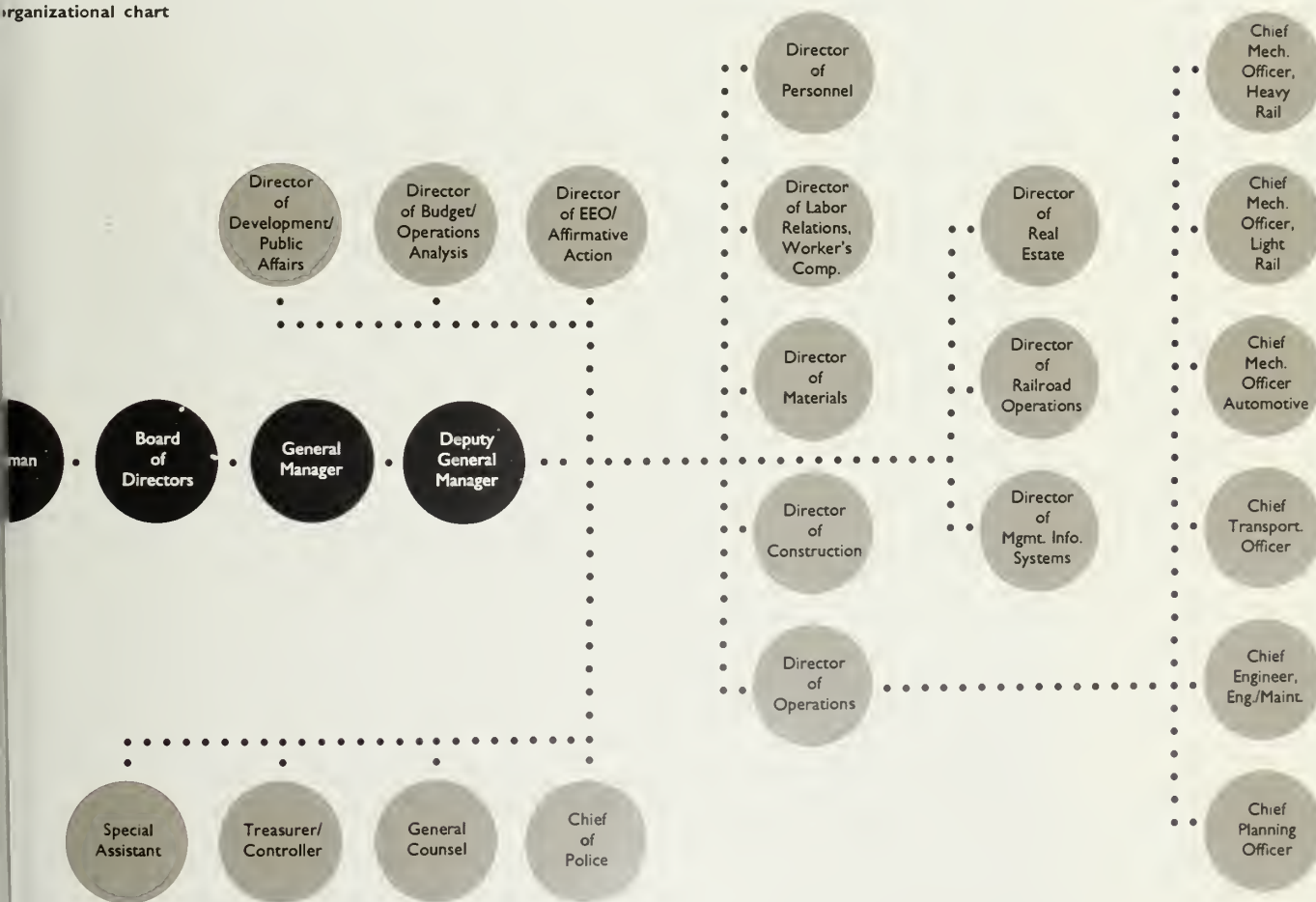
James E. Smith

Financial planner, former educator and administrator; Alumnus of Harvard Graduate School of Education. Resident of Boston.

Scott M. Stearns, Jr.

Financial planner, former educator and administrator; Alumnus of Harvard Graduate School of Education. Resident of Boston.

Organizational chart



The tremendous increase in commuter rail ridership prompted the initiation of an aggressive program to buy new coaches and expand parking capacity. The T stands ready to meet additional demands for service in the decade ahead.





BTA Service

The Massachusetts Bay Transportation Authority—the T—is the oldest subway and sixth largest public transportation system in the nation. It is also steadily transforming itself into one of the nation's most modern, investing over one billion dollars over the past four years to purchase new vehicles, renovate existing transit lines and stations, and construct new ones.

The Massachusetts Legislature formed the MBTA in 1964, building upon the former Metropolitan Transit Authority (MTA) and increasing the size of the operating district from 14 to 78 cities and towns.

On an average weekday, the Authority serves over 642,000 passengers on three rapid transit lines (Blue, Orange and Red); a four-branch light rail line (Green); 11 commuter rail lines; over 150 bus and trackless trolley routes; and door-to-door van service for passengers with special needs. The Authority also subsidizes private-sector operation of commuter boats and long-distance and community-based bus service.

From 1982 through 1987, average weekday ridership increased by 19.7 percent. Of this total, ridership on bus, streetcar, and rapid transit lines increased by 17 percent while ridership on commuter rail lines increased by 48 percent. During this same period, revenue miles of service were increased by 14.8 percent to 44.1 million miles a year and serious crime on the system decreased by over 36 percent.

Rapid Transit and Streetcar Service During a typical rush hour, 394 cars are in service on the Blue, Green, Orange and Red lines. More than 3,000 car trips are completed each day over 156 miles of right-of-way.

The Red Line is the longest of the MBTA's rapid transit lines and the most heavily travelled, serving more than 182,000 passengers daily. The line is divided into two sections: the Ashmont line runs along 12 miles of track from Alewife station in Cambridge, through downtown Boston to Ashmont station in Dorchester; the Braintree line runs 17 miles through Cambridge and downtown Boston, until it divides south of Andrew station to serve Quincy and Braintree.

The Red Line was extended southward to Quincy in 1971, to Braintree in 1979 and Quincy Adams in 1983, and northward to Davis Square in Somerville and Porter Square in Cambridge in 1984 and Alewife in North Cambridge in 1985. Construction is now underway to lengthen platforms and modernize seven older Red Line stations in Cambridge and Boston to allow for the operation of six-car rather than four-car trains. This will allow the Authority to increase carrying capacity by 50 percent.

When these modernization efforts are completed, 17 of 22 Red Line stations will be accessible for passengers with special needs.

As the year ended, the first six of 58 new Red Line cars were put into service and all but two of 74 "Silverbirds" in the Red Line fleet had been rebuilt and placed back into service.

The Blue Line, the shortest of the rapid transit lines, extends 5.9 miles from Bowdoin Square, near the State House to Wonderland in Revere. It has a vehicle fleet of 70 cars, serves 12 stations and carries more than 40,000 passengers each day. During peak-periods, the line runs at four-minute intervals from Wonderland Station, south along the Atlantic coast, past Logan International Airport, under the harbor through the first transit tunnel in the country (1904), and into downtown Boston.

Tremont Street, 1894.
Construction began on the
Tremont Street tunnel and
Park Street Station in 1895.



Rapid transit system



In the 1820's, a long version of the stagecoach, called an "omnibus," became a popular means of public transportation. It was at this time that the "commuter rail" network began to operate. Private companies built local rail systems between Boston and surrounding communities, with rail lines reaching out to the north and west of the city to

the burgeoning new mill towns of Lowell and Lawrence along the Merrimack River. By 1870, Massachusetts had more track miles per square mile than any other state in the Union — and more than any other country in the world.

Travel time between downtown Boston and Airport station is seven minutes, making the "T" the fastest and most economical way to get to the airport. Plans are now underway to modernize Blue Line stations to improve station environments and provide access for passengers with special needs, lengthen platforms to accommodate six-car trains, upgrade the signal system, and increase parking capacity at outlying stations.

The Orange Line is used by nearly 120,000 passengers daily. It stretches slightly more than 11 miles from Forest Hills in Jamaica Plain to Oak Grove in Malden, running through the heart of downtown Boston. The Orange Line fleet is composed of 120 rapid transit vehicles travelling, in part, on the new 4.7 mile Southwest Corridor.

Revenue service through the new corridor began operation on May 4, with service to nine new stations. The new corridor also accommodates MBTA Commuter Rail and Amtrak service. The new line replaces the seven station elevated structure which had been in use since 1901.

Construction of these stations as well as modernization and platform lengthening projects at three downtown stations permitted the operation of six-car, instead of four-car Orange Line service in September; this increased peak-period capacity by 50 percent.

With the completion of station modernization projects, 13 of the 19 Orange Line stations will be accessible to passengers with special needs.

The Green Line is a subway/surface light rail system consisting of four lines covering 33 one-way miles. Branches run from Lechmere in Cambridge, to North Station, through downtown and busy Park Street Station and out to Boston College (B Line - 8 miles), Cleveland Circle (C Line - 6.6 miles), Riverside (D Line - 12 miles) and the Arborway (E Line - 5.7 miles).

A fifth light rail line, the Mattapan Hi-Speed line (2.5 miles), connects Mattapan Square with Ashmont Station on the Red Line. It is the only transit line in the country that runs through a cemetery.

Each day, 220,000 passengers ride the Green Line, with service provided at 13 subway stations and 49 surface stops. During the last year, the arrival of newly-purchased Type 7 streetcars permitted the Authority to increase peak-period Green Line service from 105 to 112 cars, a 6.7 percent increase.

Currently, plans are underway to improve power supplies on each of the branches to enable future three-car train operation. And work is underway to completely rebuild the Green Line track system in the Central Subway and to upgrade power and ventilation systems.

Bus Service Over 800 buses are required each weekday to make over 15,000 trips and to provide service to 365,000 passengers over more than 700 miles along 157 local and express routes. Buses are housed in eight garages in and around Boston.

The completion of delivery of an order of 380 General Motors RTS-II buses allowed peak-period service to increase from 741 buses in 1986 to 820 buses in 1987, an increase of 10.7 percent.

In July, the MBTA received the American Public Transit Association's (APTA) Improvement Certificate award for motor bus safety in 1986. The award was presented to the MBTA in recognition of the Authority's progress in improving bus safety between 1984 and 1986.

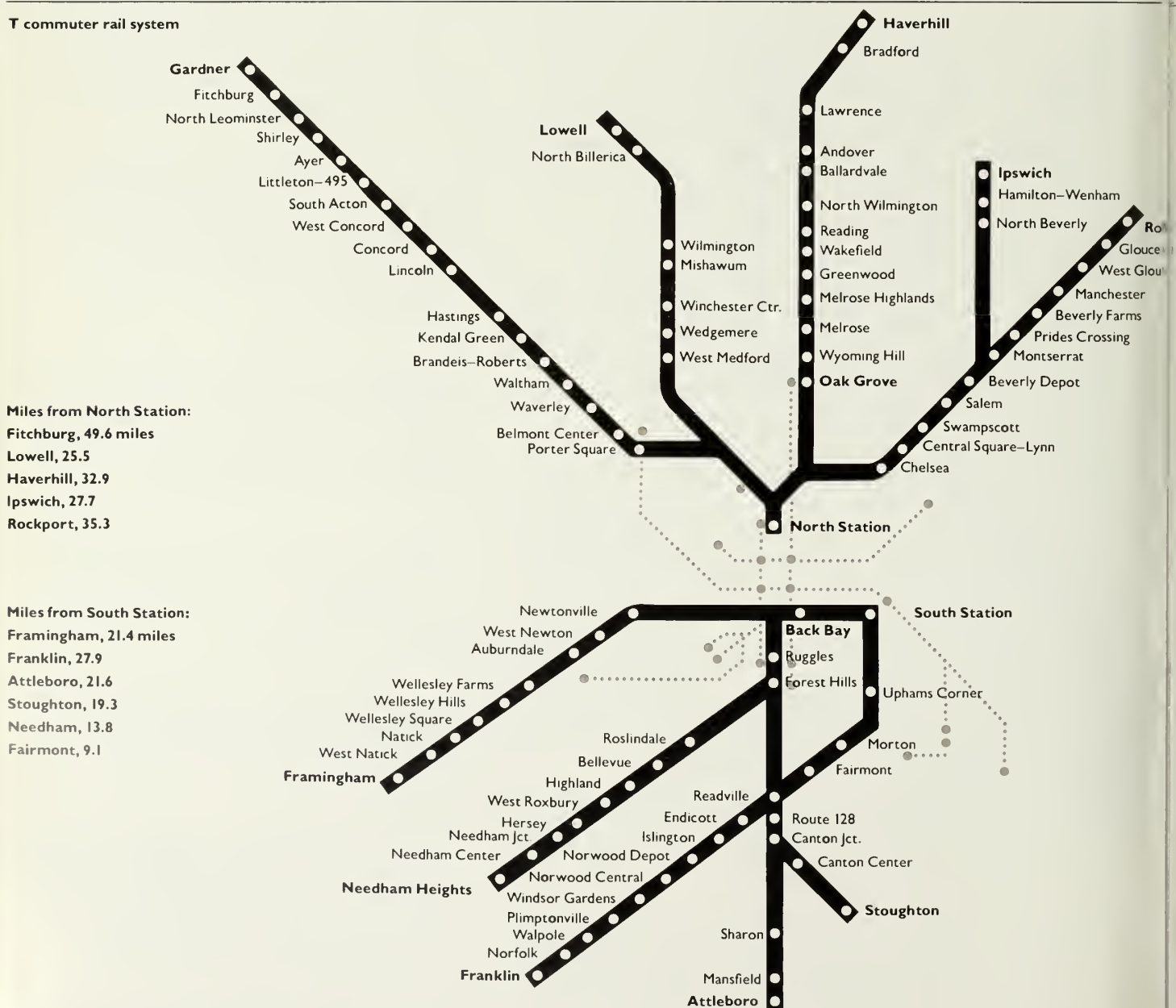
Over 80 buses in the older fleet and 190 of the newer buses are lift-equipped, with plans for all future bus purchases to be lift-equipped.



**Tremont Street Tunnel near
Boylston Station, 1898**

Over time, the streetcar became the primary mode of public transportation, as Boston's first electric streetcar lines went into operation in January, 1889 between South Square and Allston Depot, and between Beacon Street and Coolidge Corner.

T commuter rail system



1890's, the streets in downtown business district were so congested with streetcars that some passengers could reach their destination more easily walking over the trolley cars. To combat this congestion, city officials authorized the construction of a streetcar tunnel under the Boston Common

and Public Garden. Boston became the first city in the western hemisphere to boast of an electrified subway system when the Tremont Street Subway opened for service on September 1, 1897.

Tremont Street, 1913



The Authority's Call-A-Lift Bus program, began in 1986, continues to provide passengers with the opportunity to schedule lift-equipped bus service on 153 bus routes throughout the region. In 1987, the Authority registered over 2,930 requests for Call-A-Lift Bus service.

Specialized Door-to-Door Service The MBTA's Ride program provides lift-equipped, door-to-door transportation to passengers who, because of special needs, are unable to use other MBTA services. The program began modestly in 1976, providing service with two lift-equipped vans covering an urban core area of 12 square miles. Today, the Ride has 87 specially equipped vans that provide 220,000 trips annually (approximately 600 trips per day) to 24 cities and towns over a 200 square mile area. Ride service is scheduled 24 hours in advance via telephone. The Ride cost 75 cents per trip.

From 1986 through 1987, trips completed on the Ride in the program's core area grew from 180,690 to 200,687 daily riders. The core area, which has 9,000 residents registered in the program, encompasses the communities of Boston, Brookline, Cambridge, Arlington, Belmont, Newton, Watertown, Chelsea, Medford, Revere, Somerville, Everett and Malden.

In 1987, the MBTA expanded Ride service to 12 other communities: Quincy, Braintree, Weymouth and Milton to the south; Lynn, Marblehead, Nahant, Salem, Saugus and Swampscott to the north; and Framingham and Natick to the west. The northwest satellite Ride service continued in 1987, serving Burlington, Lexington, Lincoln, Concord, Woburn, Bedford, Wilmington, Winchester and Waltham.

Ride service is provided to passengers by private companies under contract to the Authority. Forty-three lift-equipped vans for the Ride program were purchased at a cost of \$964,189 and added to the fleet of in 1987.

Trackless Trolley Service Trackless trolleys, buses that run on rubber wheels and are connected by antennae-like polls to overhead wires, began service in Boston in 1936. At its peak in 1953, 451 vehicles were in use. Eventually, diesel buses and electric light rail vehicles virtually replaced the trackless trolley. Today, four lines remain and operate in Belmont, Cambridge and Watertown.

The 50 car fleet of highly reliable electric buses carries approximately 19,000 riders daily over a combined total one-way route of 15.75 miles. The trackless trolley fleet is garaged in North Cambridge.

Commuter Rail Service The Commuter Rail system consists of 11 lines that serve 97 stations and operate 354 trips each weekday to and from South or North stations. Six lines serve the region south of the city: Framingham, Needham, Franklin, Attleboro, Stoughton and Fairmount; while five lines serve communities north and west of Boston: Fitchburg, Lowell, Haverhill, Rockport and Ipswich.

The system stretches over 259 one-way miles from Boston, south to the Rhode Island border, north to the New Hampshire border and fifty-five miles to the west to Gardner.

Nearly 52,400 people ride the system each weekday, a 6.7 percent increase over 1986. Almost 85 percent of commuter rail passengers travel during peak periods, although trains operate throughout the day and during the evening. Between 1982 and 1987, commuter rail ridership rose from 35,376 to 52,372 daily passengers, an increase of over 48 percent. On the southside, with the opening in 1987 of the reconstructed Needham Line, the rerouting of the Franklin and Attleboro/Stoughton lines along the new Southwest Corridor and the start of service on the



Adams Square Station near
Faneuil Hall, 1898

At the same time, all local street railway companies were integrated under one management team, as Boston became the first American city to have a unified and centralized transit system.

By December of 1904, Massachusetts created yet another milestone — the nation's first underwater transit tunnel, running under Boston Harbor between the wharf area and East Boston.

Fairmount Line through Dorchester, Mattapan, and Hyde Park ridership increased 67.4 percent during that same five-year period.

In response to this rapid increase in ridership, the MBTA has purchased 26 locomotives and 107 coaches, of which eight locomotives and 40 coaches were purchased in 1987.

Under the right of first-refusal, the MBTA purchased the 38.5 acre Amtrak Readville yard for midday storage of the growing commuter rail fleet. The Authority organized a study to provide local residents with the opportunity to assist in identifying the best use for land not required for railroad purposes.

MBTA's commuter rail system is operated for the Authority by Amtrak under a three-year operating agreement, which began January 1, 1987. The Boston and Maine Railroad had operated the commuter rail service under two five-year agreements starting in 1976.

Subsidized Commuter Boat Service The MBTA began to subsidize privately-owned commuter boat service in 1984 between Hingham and Rowes Wharf, Boston to provide South Shore commuters with an alternate means of travel during reconstruction of the Southeast Expressway. The service became so popular that it was continued and expanded after the roadwork was completed.

In 1987, year-round commuter boat service carried riders on five vessels on up to 23 peak-direction trips each weekday. Also in 1987, to meet the steadily increasing demand for service, the total number of parking spaces at the Hingham dock was increased to 1,025.

Weekday ridership increased by 48 percent between 1986 and 1987 from 1,265 to 1,876 passengers per day. In 1987, the boat service transported 473,980 passengers across the waters of Boston Harbor.

The commuter boat system coordinates with Massport's water taxi, which runs between Logan Airport and Rowes Wharf, to facilitate the transfer of passengers between vessels and to encourage alternate means of travel in the congested airport area.

Boston Harbor Commuter Service, Inc., and Massachusetts Bay Lines, Inc., provide commuter boat service for the Authority through subsidy contracts.

Subsidized Private and Community-based Bus Service The MBTA provides a subsidy to privately-owned bus companies for the operation of regularly scheduled service among communities in Eastern Massachusetts and Boston and within these cities and towns. This subsidy, made available through the state Executive Office of Transportation and Construction provided through the MBTA's Experimental Private Carrier Service (EPCS) and ensures the availability of service in areas where the private sector, acting alone, is unable to meet passenger demand.

In 1987, the MBTA provided subsidies to 13 companies through EPCS for the operation of commuter bus service from communities including New Bedford, Fall River, Hyannis, Plymouth, Brockton, Framingham, Worcester, Peabody, North Andover and Newburyport. The MBTA also provided a subsidy to six private bus companies to service essential local routes in communities from Salem to Hull.



Copley Station, 1915 left,
Boylston Station, 1898 right.

The Suburban Bus Transportation Program provides a subsidy for the operation of local bus service in 11 communities and one Boston neighborhood. In this program, the community and the Authority each contribute to the operation of a system which provides locally-directed service at a lower cost than the MBTA could provide on its own.

The program began in 1984 when the MBTA subsidized service in Bedford, Lexington, Natick, and Needham. In July, 1985, the program was expanded to include Dedham, Framingham, and Norwood. Mission Hill LINK, Inc. (Boston) was added to the program in 1986, and in 1987 the program was expanded to include Hamilton and Weymouth.



The Ride was expanded in 1987 to serve passengers in 24 communities. Plans are underway to expand service to all 78 cities and towns in the T district.

Orange Line subway, T
commuter rail and Amtrak
passenger service operates
through the new Southwest
Corridor.





South Station was an important element in this rapid expansion. Opened on January 1, 1899, by 1916, South Station became the nation's foremost railroad terminal, surpassing even Grand Central Station in New York. Ninety trains per hour traversed its 28 tracks and 817 trains came into and out of the terminal each day.

On South Station's busiest day, June 8, 1912, 1,001 trains came and went during a streetcar strike.

The Southwest Corridor Project

The largest construction project in the history of the Commonwealth was completed on May 2, when Governor Michael S. Dukakis joined state Secretary of Transportation and Construction Frederick P. Salvucci, the MBTA Board of Directors, General Manager James F. O'Leary, and local, state, and federal officials to formally dedicate the \$743 million Southwest Corridor Orange Line Relocation Project.

Nine years of construction and sixteen years of a cooperative effort between the Authority and local residents came to fruition when Orange Line trains traversed the new tracks for the first time. Funded by one of the largest federal grants ever awarded to a transit project, the 4.7 mile Southwest Corridor Project includes the Orange Line and nine fully-accessible stations, as well as tracks for MBTA commuter rail and Amtrak passenger service.

The new line provides transit service to 25 percent of Boston's population in Jamaica Plain, Roxbury, the South End, the Back Bay and Chinatown, serving as a vital link between Boston's southern neighborhoods and the downtown business district.

The Southwest Corridor is located along the former route of the Penn Central rail line, on property originally cleared in the late 1960's for the construction of I-95 (the Southwest Expressway) to Boston. Construction of the new corridor allowed for the relocation of the Orange Line from an elevated structure over Washington Street, which had been in continuous service since 1901, to the new open air, below grade right-of-way.

The project also includes the construction of a 52-acre linear park between Forest Hills and Back Bay. The park is the first major addition to the city's park system since the Charles River Esplanade was developed over 50 years ago. It features bicycle and pedestrian paths, basketball and tennis courts, children's play areas and community gardens.

Between 1973 and 1986, the MBTA sponsored over 1,000 community meetings to provide local residents with the opportunity to participate in planning the new Corridor. Meetings were held on such varied concerns as station location, design and construction, traffic and parking, real estate development and related job training requirements.

The construction phase of the project began in 1979, and included 41 contracts, while providing more than 18,000 jobs. Of the \$450 million expended on these contracts, minority or women-owned businesses were awarded \$72 million or 16 percent of the work. Of the 3,000 member workforce employed on construction projects each year, 850 or 28 percent were minority employees. It is anticipated that 12,000 permanent jobs will result from further development along the corridor.

Southwest Corridor Real Estate Development

Parcels of land adjacent to the new corridor, left vacant after the state halted construction of the I-95 highway in 1972, are being developed with community participation for future housing, office, commercial and light industrial uses. Ruggles Station serves as a main catalyst for economic growth and revitalization in the area and the adjacent Parcel 18 site is the largest development site along the corridor.

In 1987, Columbia Plaza Associates, a minority developer, was selected to take on at least 30 percent equity participation in the development of both Parcel 18 and a downtown development site, the first major linkage program in the city's history. Plans for Parcel 18 call for the development of nearly 800,000 square feet of space on the five acre lot.

Other parcels in the Corridor will be developed for housing, light industry, and commercial activity.

Construction of the Green Line streetcar tunnel between Auditorium and Kenmore Stations, 1912



Every year between 1914 and 1919, the Boston Elevated Street Railway, as the transit authority was named, opened a new subway or elevated route. During this time, new rapid transit tunnels were constructed, elevated railway lines were extended into outlying communities, additional surface routes were established, more carhouses and terminals were

built and innovative streetcar designs were developed. In 1922, the Boston Elevated established the first motor bus route. This tremendous expansion placed public transportation at the keystone of the city's economic growth and development for the century that was to follow.

Opening Festival Neighborhood residents celebrated the opening of the new corridor with festivals entitled, *Across the Neighborhood: Celebrating Our New T.* The May 2, Saturday opening celebrations included a morning ribbon cutting ceremony at Forest Hills Station and an inaugural train ride, with brief stops at Ruggles and Back Bay stations.

The stations themselves were host to neighborhood residents and 53 performing groups. Performances included music, theatre and dance, as well as clowns, stiltwalkers, magicians and other street artists; 47 of the 53 performing groups and nearly 95 percent of festival workers were Southwest Corridor residents. The MBTA provided free train rides along the corridor, with stops at each of the stations along the way to allow riders to attend each of the separate station festivals and to experience the line in operation.

Southwest Corridor Bus Study In planning for the opening of the new Orange Line, the Authority carried out an extensive study of routes and related ridership on buses serving the Washington Street corridor, elevated Orange Line, and adjacent communities. Results of this study assisted in redesigning bus routes and schedules to best serve the needs of passengers, many of whom are highly dependent on public transportation.

Transition: Old to New Opening of the new Orange Line and ending of service on the elevated structure required changes to the routes and schedules of 22 bus routes, operation of up to 100 shuttle buses over a three-day period between Forest Hills and Haymarket, throughout downtown Boston, and a massive public information campaign.

Uniformed personnel, construction workers, and hundreds of administrative and executive staff employees rose to the occasion in one of the MBTA's finest hours to make the transition remarkably smooth and trouble free. This effort included providing important service information to over 100,000 Orange Line passengers and tens of thousands of bus passengers, as well as the many workers and businesses affected by the downtown busing operation.

Southwest Corridor Commuter Rail: On October 5, the MBTA opened the new Southwest Corridor to Franklin, Attleboro and Stoughton commuter rail and to Amtrak intercity passenger service. New commuter rail stations include Ruggles and Back Bay. These lines had operated through Dorchester on the Midlands Branch while the Southwest Corridor was under construction.

New Fairmount Line Service Operation of train service through the new corridor provided the Authority with the opportunity to begin new commuter rail service on the Midlands Branch between South Station and Fairmount. Stations on the new Fairmount Line are Uphams Corner in Dorchester, Morton Street in Mattapan, and Fairmount in Hyde Park.

Construction workers at the
Beacon Hill Tunnel, 1910



Needham Line Service Service began on October 19 on the rehabilitated Needham commuter rail line, which had been out of service since 1979 due to the construction of the Southwest Corridor. The \$14 million project included the restoration of eight stations and complete track replacement.

Construction included new track and signal systems, longer station platforms, as well as special mini-high level platforms which provide access for passengers with special needs, resurfacing of parking lots, and installation of new lighting and landscaping.

The Needham Branch had been in operation since the 1830's before construction of the new corridor required a suspension of service. Today, Needham riders are able to travel to South Station as well as to three new Southwest Corridor Orange Line stations and adjacent business, commercial and educational centers.

The Old "EI" The first phase of the demolition of the old Orange Line elevated structure that ran above Washington Street between Forest Hills and downtown Boston began after the end of elevated service on April 30.

A study is currently underway to determine the type of service to be provided along the Washington Street corridor as a permanent replacement to the elevated Orange Line. While this study is underway, the Authority is providing extensive bus service between Roxbury's Dudley Square and downtown Boston.

When demolition of the old structure is complete, the Authority will work with the city to rebuild Washington Street in Jamaica Plain, Roxbury, and the South End.

Small Business Loan Program Governor Michael S. Dukakis signed legislation this year, authorizing the MBTA to provide below-market interest rate loans to small businesses affected by the Authority's activities, particularly in the Washington Street Corridor. The program is designed to give local businesses the chance to share in economic opportunities and maintain their operations during and after the demolition of the elevated structure. The first loan in the program is expected to close in 1988.

Kendall Station, the 1st of 10 stations to be completed under an \$80 million modernization/platform lengthening project, is helping to revolutionize the face of Cambridge's Kendall Square Redevelopment Area.





Construction projects

Including the Southwest Corridor Project, the MBTA has invested approximately \$300 million per year over the last five years in an aggressive program to rebuild the infrastructure, modernize stations, expand rail lines, and increase parking capacity to meet the needs of ever increasing ridership.

Red Line Track Reconstruction Project The first comprehensive effort since 1909 is underway to rebuild and modernize the Red Line track between Harvard and Andrew stations. Work includes the total replacement of ballast, ties, rail, switches, crossovers and related equipment. New heavier, continuously-welded rail will provide a smoother, more reliable ride for Red Line passengers.

Starting in May, 1985, track reconstruction work was carried out between Harvard and Charles stations. In mid 1987, the second phase of the trackwork project got underway between Charles and South stations, with work continuing to be carried out at night to minimize inconvenience to passengers. The entire project between Harvard and Andrew will be completed by the spring of 1989.

Green Line Track Reconstruction Project A comprehensive project is also underway to reconstruct the Green Line track system. This project, which began in February 1985, includes the removal and replacement of ballast, ties, switches, and rail between North station and the tunnel portals on the Boston College (B), Cleveland Circle (C), Riverside (D) and Arborway (E) lines.

Work has been completed between North and Boylston stations, the Huntington Avenue tunnel, the Copley and Kenmore junctions, Kenmore's main track and loop, and the Commonwealth Avenue portal. In 1987, work included the reconstruction of the main track between Copley and Kenmore, and the portals on the Riverside and Cleveland Circle lines.

Trackless trolleys, buses that have electric traction, rather than combustion motors, and are connected with antennae-like poles to overhead wires, began service in 1936. By 1953, 451 vehicles were in use.

Eventually diesel buses and electric streetcars began to replace the highly reliable trackless trolleys on most

routes and today only four lines remain, concentrated in the Cambridge area.

The Green Line Track Reconstruction Project is carried out after 9:00 p.m. week nights, and on some weekends, to minimize passenger inconvenience and neighborhood disruption. All Green Line work is scheduled to be completed in early 1989.

Station Modernization/Platform Lengthening Project An \$80 million project is underway to modernize stations and lengthen platforms at seven Red Line and three Orange Line stations in the downtown area, South Boston and Cambridge. The Red Line stations are Central, Kendall, Park Street, Downtown Crossing, South Station, Broadway and Andrew; Orange Line stations include Chinatown, Downtown Crossing, and State.

The lengthening of platforms will allow the operation of six-car rather than four-car trains, thereby increasing passenger carrying capacity by 50 percent. Six-car Orange Line service began in September; six-car Red Line service will begin in early 1988.

Modernization work at the stations includes the installation of new walls and floors, improved lighting, security and fare collection systems, new escalators and elevators for passengers with special needs, and permanent works of art.

In November, modernization work was completed at Kendall Station in Cambridge, the first of the ten stations completed in this program. The modernization included construction of longer platforms, a new quarry-tiled interior, two dramatic glass, copper and granite entrances, and the "Kendall Band," an interactive three part musical sculpture.

Modernization work at Central Station in Cambridge is scheduled to be completed in early 1988; at the downtown stations in mid-1988; remaining stations in 1989.

The transit network as a whole continued to grow through the 1940's and 1950's. A new agency, dubbed the Metropolitan Transit Authority (MTA), took over for the Boston Elevated in 1947 and expanded service to include 14 cities and towns in the Boston area. The MTA ran the system through 1964.

That year, the Massachusetts Legislature created the Massachusetts Bay Transportation Authority (MBTA) and expanded the system to include 78 cities and towns.

Because fares cannot match the cost of operating service, member communities and the Commonwealth apportioned the net cost of service between themselves, allowing the MBTA to operate at a deficit.



JFK/UMass Station Modernization A \$13.5 million project began in April to modernize JFK/UMass Station and to construct a second platform to serve Braintree branch Red Line passengers travelling to points including the University of Massachusetts, the JFK Library, the State Archives Building and the Bayside Expo Center. The project will be completed in two years.

Modernization efforts include the construction of a new station lobby; the installation of public address and security systems; the rehabilitation of the Ashmont branch platform; the installation of elevators for access for passengers with special needs; the construction of a new bus loop with an enclosed waiting area; and landscaping of the station area.

South Station Intermodal Transportation Center Construction is underway to transform the MBTA's South Station into the South Station Transportation Center, a first-class multi-modal transportation facility. When completed, the station will include high-level, wheelchair accessible commuter rail platforms; a rail passenger concourse and train room serving Amtrak interstate and MBTA commuter rail lines; a 40-berth intercity and airport bus terminal; an underground passageway for direct access to the newly modernized Red Line rapid transit station; new offices on the upper four floors and shops on the concourse level of the five story station terminal; and parking in a new garage. The Center will accommodate future development by utilizing the air rights above the tracks, bus terminal and parking facilities.

During 1987, the MBTA began operation on six tracks with high level platforms and opened the trackhead structure. Work on the rehabilitation of the 1899 headhouse continued, with the offices, ticket office and a portion of the grand concourse scheduled to open in 1988.

Also, the Authority selected the Beacon Companies, a private firm to work in a public-private partnership to develop and manage the completed facility. Revenue from office and retail rents will provide non-fare-box revenue to offset MBTA operating costs.

The MBTA is carrying out the rehabilitation and development of the South Station terminal building in cooperation with the Boston Redevelopment Authority, the Federal Railway Administration (FRA) and the Urban Mass Transportation Administration (UMTA).

Rockport and Ipswich Line Improvements

Since 1984, the MBTA has carried out an aggressive program to rebuild virtually the entire Rockport and Ipswich commuter rail lines. This effort includes over \$160 million in capital expenditures, and incorporates the construction of new bridges at North Station and between Beverly and Salem, new stations at Salem, Swampscott and Lynn, and installation of new track and signal systems. Most of the work is funded entirely by the Commonwealth.

In July, track improvement and bridge reconstruction projects began in Lynn, Everett, Salem and Revere. These projects, to be completed in several phases, include improvements to the track system and retaining walls, as well as reconstruction of bridges over the Saugus River in Lynn and Pines River in Revere (\$14.5 million total), and Draw 7 over the Mystic River between Charlestown and Everett (\$34.5 million).

A \$23 million project began in September to replace 2 miles of track, ties, and ballast, as well as six grade crossings between Everett and Salem. Track, signal system and parking expansion projects are scheduled to begin in 1990.



Station Kiosks, 1927

Parking Dramatic increases in ridership have strained capacity at MBTA parking facilities throughout the region. Parking areas adjacent to rapid transit, light rail and commuter rail stations are often filled to capacity by 8:00 a.m. In large measure, particularly at commuter rail stations, future ridership increases are contingent upon the provision of additional parking spaces.

In addressing the problem, the Authority's Transit Park-Ride Program has identified approximately 65 sites where parking additions can be made. These sites include projects now underway in Lynn, Franklin, and South Attleboro, as well as others in many other communities which are in preliminary design or study phases.

In addition, a project was begun this year to rehabilitate the 872-car, five-level Quincy Center Station Parking Garage in Quincy.

Lynn Station Demolition work began in preparation of the construction of a new \$41 million multi-modal transportation facility in Lynn. The station and garage project includes a new commuter rail station, on-street bus terminal, and a five level, 1,050-car parking garage. The garage will feature an arcade that includes commercial and retail space.

High-level train platforms and two elevators in the parking garage will provide full access for passengers with special needs. An original sculpture has been commissioned to be installed in the new station's plaza. Features in the new station are designed to permit the future extension of the MBTA's Blue Line to Lynn.

Salem Station and Swampscott Station Work was completed during the summer on a project to build a new commuter rail station in Salem and rehabilitate the existing station in Swampscott. The new Salem Station provides parking for 235 cars and allows the closing of the old station which had been in use for over one hundred years. Swampscott Station provides parking for 75 cars. Both stations now have new sheltered platforms, improved lighting and drainage, access for passengers with special needs and landscaping.

South Attleboro Station Construction of a commuter rail station began in South Attleboro in August on the Attleboro Line. The station will provide 502 parking spaces, which will help alleviate congestion in downtown Attleboro, while meeting the needs of the lines rapidly increasing ridership. The station is near the junction of I-95 and Route 1A, and will feature sheltered platforms, mini high-level platforms, and a pedestrian overpass.

Forge Park/495 Station Construction commenced in March on a state-funded 3.5 mile extension of the Franklin commuter rail line and a new station and 800-car parking lot on an eight acre site in Franklin. Land for the station was donated to the Authority by National Development Associates, developers of a mixed-use project adjacent to the station.

Construction of the new facility will be carried out in two phases. The first phase will allow for the start of service, and will to be completed in the late spring of 1988. It includes construction of new track, a station platform and a parking lot for 381 cars. The second phase, to be completed in 1989, will add two mini-high level platforms to provide access for passengers with special needs, a building with a waiting room and concession space, a 355 car parking lot, and a new train layover facility.



Future Projects

Green Line/North Station The Authority is working on a project to relocate the Green Line between Haymarket and Science Park stations. The multi-phased engineering project includes putting the Green Line underground, in a new alignment behind Boston Garden; extending high-level commuter rail platforms over the new Green Line at North Station; constructing a new North Station Orange Line/Green Line "super station" with inbound access to both lines from a common platform; and installing foundations for future air-rights development of a new Boston Garden over the commuter rail tracks. This project would allow for the demolition of the existing elevated structure over Causeway Street and enhance economic development in the area.

Green Line/Lechmere Design work is underway to relocate the Green Line at Lechmere from the west to the east side of McGrath Highway. This would allow the construction of a larger, more functional station, for opportunities for improved connections with feeder buses, for construction of a major car barn and maintenance facility, and for the potential for future extension of the Green Line into Somerville. The project would also improve the flow of vehicular traffic by allowing the demolition of the elevated Green Line structure over McGrath Highway.

Old Colony Railroad Rehabilitation Project A study is underway, at the direction of the Massachusetts Legislature, to investigate the restoration of commuter rail service on the three-branch Old Colony Railroad between South Station and Scituate on the Greenbush Line, Plymouth, and Middleboro.

The Old Colony Railroad had provided commuter rail service for over 100 years until it ceased operation in 1959 when the Southeast Expressway was constructed. The "Old Colony" region has become the fastest growing area in the state and its roads have become clogged with a continually increasing number of automobiles.

The study includes the preparation of an Environmental Impact Statement and a series of community meetings in all of the 23 communities through which the line passes, as well as in adjacent communities. The study is expected to be completed in 1989.

Ipswich Line Extension To Newburyport The MBTA undertook a study to investigate the extension of the Ipswich commuter rail line 8.7 miles from Ipswich to Rowley and Newburyport. The extension would require the rehabilitation of track and signal systems, the construction of two new stations, parking facilities, and related amenities. Service was provided on the line until 1971 when low ridership forced cancellation of service.

Charles/Bowdoin Connector Connecting the Blue Line at Bowdoin Station to the Red Line at Charles Station is the focus of a study now underway. The Blue and Red lines are the only lines in the system which are not connected. This creates a great deal of pedestrian congestion at other key transfer points in the system and discourages passengers from using public transportation, particularly to the congested airport area served by the Blue Line and to employment centers served by the Red Line.



MBTA is currently studying the need for a new transit line in the South Boston/Fan Pier area. The study is looking at both existing and new technologies, as well as several different alignments, and innovative financing techniques to gain the financial participation of potential developers.

The construction of a new transit line in the South Boston/Fan Pier area is a major project for the MBTA. The study is looking at both existing and new technologies, as well as several different alignments, and innovative financing techniques to gain the financial participation of potential developers.

Arborway Corridor Study Street construction has required the temporary suspension of Green Line light rail service in the Arborway Corridor (Huntington Avenue/Center Street) in Jamaica Plain. Taking advantage of this opportunity in September of 1986, the Authority began an investigation to determine if light rail service still remains the best transportation option for the corridor, or if another mode might provide better and/or more cost-effective service. The Arborway Transit Study calls for a series of public meetings in addition to the collection of technical data.

Green Line "A" Service to Watertown Green Line light rail service between the Central Subway and Watertown, via Brighton Avenue ended in 1969 because of low ridership and a shortage of light rail vehicles in the system. The tracks are still used by Green Line work cars and light rail vehicles which are stored or serviced at the Watertown Car Barn.

The Authority is currently studying the line to determine if light rail service should be restored, or if current bus service is adequate to meet passenger demand. The Watertown Trolley Study includes public participation as well as compilation of technical data.

South Boston Fan Pier Study The MBTA is working to determine the best possible transportation alignment and mode to provide service to the newly-emerging South Boston/Fan Piers area, the proposed site for hundreds of thousands of square feet of new office development. The study is looking at both existing and new technologies, as well as several different alignments, and innovative financing techniques to gain the financial participation of potential developers.

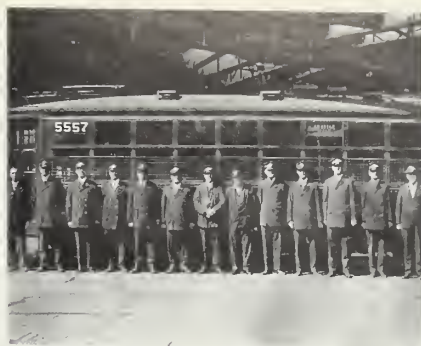
Circumferential Transit Study A long-range study is underway to determine the need for crosstown transit links between neighborhoods located approximately five miles from the downtown area. Currently, the majority of MBTA lines provide service to the downtown area.

Rather than keying on the development of one new transit line, the study is investigating the use of different modes between various locations as the best way to meet unmet demand.

The T's South Station, built in 1899, is being rehabilitated to provide high-level commuter rail platforms, direct access to the modernized Red Line subway station, an overhead bus terminal and parking garage, a grand passenger concourse and over 100,000 square feet of first class office and retail space.



Motormen, Brattle streetcar,
1929; inspector training class
Sullivan Station, 1939



Programs

Passenger Relations Training Program A program was developed to assist over 1,200 bus and light rail vehicle operators improve their daily interaction with passengers in what are often extremely stressful situations. As such, the one day program is keyed to identifying components of good passenger relations—encouraging good communication and problem solving skills and teaching how to manage stress. Each session is taught by a two-person team of trained operators.

In 1988, the Authority plans to expand the program to inspectors, collectors, and other personnel who come into direct contact with the public.

Real Estate Development The Authority's Development Department works with the private sector to enhance non fare-box revenue through the lease of MBTA facilities for non-transportation, non-competing purposes. A milestone event in this program was the selection of a private developer for the South Station Intermodal Transportation Center.

Also in 1987, the MBTA entered into a public/private partnership agreement in Newton Centre, at Harvard Square, and at Alewife Station. In Newton, the Authority began a partnership with the Abbruzzi Company of Newton to rehabilitate the 1888 H.H. Richardson-designed Newton Centre Station on the Green Line. The station building will house a magazine shop, a florist, a bakery, a delicatessen and an MBTA monthly pass outlet. In addition to rehabilitating the building, the developer will pay rent to the Authority and will maintain the entire station area.

In Cambridge, the MBTA entered into an agreement to lease the air rights for a new 94,000 square foot building to be built above the Mount Auburn Street Bus Tunnel near Harvard Square and into a separate agreement to develop the retail space at Alewife Station on the Red Line. At Alewife, the developer plans to bring in a wide variety of service industries, including a fast-food restaurant, a bank, a photo shop and a cleaners.

As construction of the Southwest Corridor progressed and neared its final stages, the Authority chose a minority firm to develop Parcel 18, the five acre tract of land adjacent to the new Ruggles Station. Negotiations are currently underway to select a majority developer in the project.

Bicycles on the T For the first time, the Authority allowed bicycles on northside commuter rail trains every Sunday from July through September under an experimental program. Cyclists were required to register and to reserve space in advance.

The success of the Sunday-only rapid transit *Bikes on the T* program paved the way for this expansion to commuter rail. It is anticipated that the program will be expanded in 1988 to permit bicycles year-round.

Anti-Crime Campaign Governor Dukakis's comprehensive 1983 anti-crime program has produced a reduction in crime on the system. Serious crime on the MBTA has declined 30 percent since 1982, while ridership has increased by 15 percent over the same period. Crime on the system was down more than 18 percent from 1986 through 1987.

The T built a public park over the new Orange Line between Back Bay and Massachusetts Avenue Stations. Plans call for the Metropolitan District Commission (MDC) to take over ownership and maintenance of the park upon its completion.

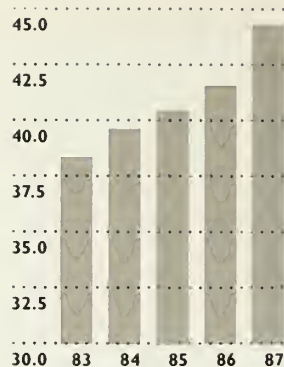


System Map for Children The MBTA publishes a map designed especially for children. The map is produced in full color and includes numerous illustrations to allow youngsters to take advantage of the area's many cultural, educational, and recreational opportunities. At the same time, it educates them to appreciate and use public transportation.

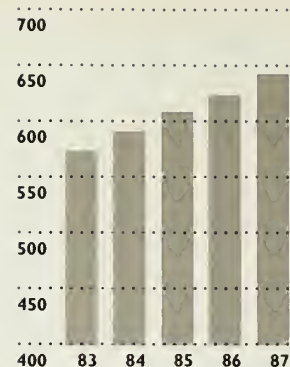
Produced in conjunction with the Boston Children's Museum, the map will be used by the Authority in its ongoing relationships with local schools and community organizations, including the "T Smarts" program organized by Camp Fire Boys and Girls.

Minority Support Program The Authority is expanding its efforts this year to assist minority and women-owned businesses in participating in MBTA construction contracts. In addition, the MBTA continues to help residents of areas affected by MBTA construction projects to obtain meaningful employment and career opportunities in construction-related industries. The Contractors Association of Boston (CAB) is working with the Authority in this program.

Assistance offered to MBE/WBE firms includes skills training in areas where such firms are underrepresented; marketing advice, technical aid and pre-apprenticeship training and job placement.



Annual revenue miles of service
1983-1987
In millions



Average weekday ridership
1983-1987
In thousands

1987 service overview

		Vehicle requirements*	Routes*	Route miles**	Daily average weekday passengers	Station
Bus		820	157	700	365,000	approx. 100
Rapid transit	Red Line	124	2	Braintree 17.6 Ashmont 11.7	182,000	
	Blue Line	56	1	5.9	40,000	
	Orange Line	100	1	11.2	120,000	
	Green Line	Streetcars; 112 LRVs, 6 PCCs	5	34.8	220,000	
Trackless trolley		25	4	15.8	15,000	
Commuter rail		43 locomotives	11	258.8	52,400	
		168 coaches				

*Weekday a.m. peak period service.

**Route-miles are one-way only.

Revenue miles for total system, calendar year

		Total trips	Revenue miles	Non-revenue miles	Station
Rapid transit	Orange Line	202,354	4,481,997	47,488	4,529
	Red Line (Ashmont)	152,735	3,076,220	12,567	3,088
	Red Line (Braintree)	169,864	5,098,609	214,077	5,312
	Blue Line	240,239	2,784,895	51,446	2,836
	Total rapid transit	765,192	15,441,721	325,578	15,767
Surface transit	Streetcar	386,623	4,855,572	45,987	4,901
	Bus	2,185,352	23,050,039	3,146,156	26,196
	Trackless trolley	85,993	742,085	6,362	748
	Total surface	2,657,963	28,647,696	3,198,505	31,846
	Total system	3,423,160	44,089,417	3,524,083	47,613



**Monthly pass sales
1983-1987**
In thousands



**Capital expenditures
1983-1987**
In millions of dollars

Revenue by mode, by calendar year
Dollars in millions

		1984	1985	% increase 84-85	1986	% increase 85-86	1987	% increase 86-87
transit	Orange Line	\$ 13.97	\$ 14.23		\$ 16.05		\$ 16.63	
	Red Line	\$ 17.80	\$ 18.63		\$ 19.65		\$ 20.52	
	Blue Line	\$ 3.48	\$ 4.32		\$ 4.37		\$ 4.61	
	Green Line	\$ 17.86	\$ 19.46		\$ 18.19		\$ 19.87	
	Total							
	Rapid transit	\$ 53.11	\$ 56.64	6.65%	\$ 58.26	2.86%	\$ 61.63	5.78%
e transit	Bus	\$ 36.42	\$ 35.23		\$ 37.91		\$ 36.24	
	Trackless trolley	\$ 1.11	\$ 0.93		\$ 1.19		\$ 1.16	
	Streetcar	\$ 9.61	\$ 10.61		\$ 8.21		\$ 9.95	
	Total surface	\$ 46.96	\$ 46.77	0.43%	\$ 47.31	1.18%	\$ 47.35	0.08%
	Miscellaneous	\$ 0.95	\$ 1.10	—	\$ 1.09		\$ 1.77	
Total revenue		\$101.02	\$104.51	3.45%	\$106.66	2.06%	\$110.75	3.83%

Average MBTA weekday ridership

	1982	1983	1984	1985	1986	1987	% increase 86-87	% increase 82-87
MBTA system*	501,792	527,685	548,290	556,626	566,439	587,942	3.8%	17.2%
uter rail**								
ide	19,148	21,480	17,978	19,586	21,046	25,546	21.8%	33.4%
de	16,228	21,496	23,098	25,064	28,030	26,826	(4.3%)	65.3%
	35,376	42,976	41,076	44,650	49,076	52,372	6.7%	48.0%
uter boat***	—	—	—	985	1,317	1,937	47.1%	92.0%*
stem	537,168	570,661	589,366	602,261	616,832	642,251	4.1%	19.5%

*Represents linked trips — the average number of individuals served on a given day, regardless of the number of modes used by the individual.

**Represents the average number of passenger boardings over the course of a full day.

***1985-1987

Ruggles Station, at the center of the new Orange Line, and served by T commuter rail and local buses, will spur economic development that for too long has bypassed Boston's Roxbury neighborhood.



Massachusetts Bay Transportation Authority

Balance sheet

As of December 31, 1987 and 1986

Dollars in thousands

		1987	1986
Assets			
Transportation property	At cost (Notes 1 and 6):		
	Transportation property in service	\$3,262,220	\$2,284,756
	Less: Accumulated depreciation	523,728	434,897
		\$2,738,492	\$1,849,859
	Construction in progress	371,659	1,016,543
	Property held for expansion	13,574	13,574
	Total transportation property	\$3,123,725	\$2,879,976
Special funds	Consisting of cash and short-term investments (Note 8):		
	Settlement funds (Note 7)	\$ 41,755	\$ 71,696
	Construction funds	49,436	61,744
	Federal grant and other special funds (Notes 1 and 6)	1,407	821
	Total special funds	\$ 92,598	\$ 134,261
Deferred charges	Note 1	\$ 9,565	\$ 9,467
Current assets	Cash (Note 8)	\$ 12,780	\$ 11,360
	Temporary cash investments (Note 8)	7,453	7,730
	Accounts receivable:		
	Commonwealth of Massachusetts (Notes 1 and 2)	211,204	153,870
	Federal Department of Transportation (Note 3)	18,810	20,545
	Other	10,023	8,895
	Materials and supplies, at average cost	33,196	28,195
	Prepaid expenses	5,729	4,120
	Total current assets	\$ 299,195	\$ 234,715
	Total assets	\$3,525,083	\$3,258,419
Liabilities			
Long-term debt	Exclusive of current maturities:		
	Bonds payable (see separate statement and Notes 5 and 6)	\$ 913,191	\$ 832,148
Unreimbursed cost			
Service	Note 1	\$ (76,007)	\$ (66,953)
Grants	Notes 1 and 6:		
	Federal grants	\$2,444,984	\$2,301,578
	State and local grants	92,729	59,901
	Less: Accumulated amortization	310,832	243,460
	Total grants	\$2,226,881	\$2,118,019
Commitments and contingencies	Notes 1, 6, 7 and 10		
Deferred credits	Note 7	\$ 77,585	\$ 74,261
Current liabilities	Current maturities of bonds payable	\$ 34,725	\$ 31,895
	Short-term borrowings (Note 5)	235,000	160,000
	Accounts payable	18,573	21,717
	Accrued liabilities:		
	Payroll and vacation (Note 1)	18,410	17,955
	Interest	24,927	23,378
	Other	51,798	45,999
	Total current liabilities	\$ 383,433	\$ 300,944
	Total liabilities	\$3,525,083	\$3,258,419

The accompanying notes are an integral part of these financial statements.

Massachusetts Bay Transportation Authority
Statement of Revenue and Cost of Service
For the years ended December 31, 1987 and 1986
Dollars in thousands

		1987	1986
Operating revenue	Not including local and federal assistance:		
	Revenue from transportation	\$ 109,901	\$ 109,901
	Revenue from other railway operations	5,261	5,261
	Total operating revenue	\$ 115,162	\$ 115,162
Operating wages and related employee benefits	Wages	\$ 193,489	\$ 182,489
	Medical and dental insurance	30,015	29,015
	Pensions (Note 9)	32,904	32,904
	Social Security taxes	15,691	15,691
	Workers' compensation (Note 1)	8,026	8,026
	Other	2,484	2,484
	Employee benefit and general and administrative costs capitalized (Note 1)	(13,364)	(13,364)
	Total operating wages and related benefits	\$ 269,245	\$ 259,245
Operating expenses	Materials and services	\$ 64,200	\$ 59,200
	Depreciation and amortization (Note 1)	91,044	61,044
	Fuel	17,160	17,160
	Injuries and damages (Note 1)	13,528	13,528
	Railroad commuter expense, net (Note 4)	53,357	53,357
	Other	1,641	1,641
	Total operating expenses	\$ 240,930	\$ 205,930
	Operating loss	\$(395,013)	\$(359,013)
Non-operating income	Interest income	\$ 5,715	\$ 5,715
	Sale of tax benefits	5,903	5,903
	Total non-operating income	\$ 11,618	\$ 11,618
Interest expense	Bonds payable (Note 5)	\$ (59,438)	\$ (59,438)
	Other	(7,964)	(7,964)
	Total interest expense	\$ (67,402)	\$ (67,402)
Cost of service in excess of revenue	Before extraordinary loss	\$(450,797)	\$(407,797)
	Extraordinary loss on advance refunding of debt (Note 5)	(10,115)	(2,115)
	Cost of service in excess of revenue (Note 1)	\$(460,912)	\$(409,912)

The accompanying notes are an integral part of these financial statements.

Massachusetts Bay Transportation Authority**Statement of unreimbursed cost of service**

For the years ended December 31, 1987 and 1986

Dollars in thousands

	1987	1986
Balance at beginning of year	\$ (66,953)	\$ (47,779)
Add:		
Cost of service in excess of revenue	\$(460,912)	\$(432,446)
Deduct:		
Net cost of service reimbursable by the Commonwealth of Massachusetts (Notes 1 and 2)	\$ 280,534	\$ 269,155
Contract assistance from the Commonwealth for debt service pursuant to Section 28 of Chapter 161A of the General Laws, as amended (Note 2)	74,050	67,842
Other contract assistance (Notes 2 and 4)	10,229	9,246
Reimbursement of the Authority's net cost of service (Notes 1 and 2)	\$ 364,813	\$ 346,243
Federal operating assistance pursuant to Section 5 of the Urban Mass Transportation Act of 1964, as amended, and Section 9 of the Surface Transportation Act of 1982 (Note 3)	\$ 18,810	\$ 20,545
Reimbursement of railroad commuter expense by government entities outside the Authority's area (Notes 2 and 4)	539	477
State diesel and gasoline fuel taxes reimbursable to the Authority in accordance with Section 2 of Chapter 563 of the Acts of 1964	527	471
Other reimbursements	\$ 19,876	\$ 21,593
Amortization of grants (Notes 1 and 6)	\$ 67,169	\$ 45,436
Balance at end of year	\$ (76,007)	\$ (66,953)

The accompanying notes are an integral part of these financial statements.

Massachusetts Bay Transportation Authority

Statement of changes in financial position

For the years ended December 31, 1987 and 1986

Dollars in thousands

		1987	
Operations	Cash was used for:		
	Cost of service in excess of revenue before extraordinary loss	\$450,797	\$440,000
	Extraordinary loss on refunding of debt	10,115	10,115
	Cost of service in excess of revenue	\$460,912	\$450,115
	Charges to cost of service not requiring current expenditure of cash:		
	Depreciation and amortization of deferred charges	\$(91,044)	\$(91,044)
	Amortization of bond discount	(874)	(874)
	Increase (decrease) in accounts receivable:		
	Commonwealth of Massachusetts	57,334	(8,000)
	Changes in all other working capital except cash, temporary cash investments, short-term debt and receivable from the Commonwealth	1,344	(1,344)
	Cash used for operations	\$427,672	\$200,000
	Cash was provided for operations and bond payments by:		
	Reimbursement of the Authority's net cost of service	\$364,813	\$340,000
	Other reimbursements	19,876	19,876
	Other	(1,280)	(1,280)
	Cash was provided for operations and bond payments	\$383,409	\$358,596
Capital and financing activities	Cash was used for:		
	Additions to transportation property, net	\$333,888	\$300,000
	Bonds refunded	59,595	11,000
	Increase in special funds	86,148	10,000
	Principal payments on debt	27,967	27,967
	Payments on short-term borrowings	—	8,000
	Total cash used	\$507,598	\$655,967
	Cash was provided by:		
	Grants from federal and other sources	\$166,831	\$200,000
	Increase in deferred credits	12,524	12,524
	Issuance of bonds and notes	245,838	245,838
	Use of special funds	127,811	8,000
	Total cash provided	\$553,004	\$546,362
Change in cash and temporary cash investments	Cash and temporary cash investments:	\$ 1,143	\$ 1,143
	Beginning of year	19,090	19,090
	End of year	\$ 20,233	\$ 20,233

The accompanying notes are an integral part of these financial statements.

Massachusetts Bay Transportation Authority

Statement of bonds payable

December 31, 1987 and 1986

Notes 5 and 6

Massachusetts Bay Transportation Authority

System Bonds issued under General laws, Chapter 161A, Section 23 of the Commonwealth of Massachusetts, are all payable in annual installments on March 1; interest is payable

semiannually on March 1 and September 1. The bonds were issued to provide funds for the financing of the authority's plant and equipment improvement program (dollar amounts in thousands).

Description	Year of maturity	Approximate annual principal payments	Average interest rate	Bonds outstanding December 31	
				1987	1986
Series A Bonds dated March 1, 1967	2007	\$2,600	3.74%	\$ 52,000	\$ 54,600
Series A Bonds dated September 1, 1970	2010	1,540	6.37	35,320	36,860
Series A Bonds dated September 1, 1972	2012	865	5.14	21,525	22,390
Series A Bonds dated June 1, 1974	2014	1,800	6.26	48,000	49,800
Series A Bonds dated September 1, 1977	2017	2,510	5.99	58,450	60,960
Series A Bonds dated May 1, 1979	2019	1,700	6.76	46,400	48,100
Series A Bonds dated October 1, 1981	2001	2,250	11.52	6,750	9,000
Series A Bonds dated April 1, 1982	2005	2,965	11.23	18,589	21,203
Series A Bonds dated March 15, 1983	2008	2,422	7.82	43,422	45,207
Series A Refunding Bonds dated August 15, 1983	2004	2,129	8.16	16,960	17,980
Series A Variable Interest Rate Bonds dated November 1, 1984	2014	1,351	4.29	87,510	88,610
Series A Bonds dated August 2, 1985	2006	2,553	5.44	31,515	93,130
Series A Bonds dated April 1, 1986	2011	1,973	7.24	97,856	99,435
Series A Refunding Bonds dated April 15, 1986	2005	1,518	6.87	140,605	141,760
Series A Bonds dated March 1, 1987	2017	784	6.64	50,554	—
Series A Refunding Bonds dated March 1, 1987	2006	645	5.86	70,324	—
Series C Bonds dated July 15, 1987	2012	950	6.80	50,00	—
general transportation system bonds payable				\$875,780	\$789,035

The accompanying notes are an integral part of these financial statements.

Massachusetts Bay Transportation Authority

Statement of bonds payable

December 31, 1987 and 1986

Notes 5 and 6, continued

Boston Metropolitan District (BMD) Bonds were issued for transit purposes prior to formation of the Massachusetts Bay Transportation Authority in 1964. For all issues

except the Equipment Bonds, bond maturities in excess of the stated annual payments are refinanced and have been classified as long-term debt (dollars in thousands).

Description	Year of maturity	Approximate annual principal payments	Average interest rate	Bonds outstanding December 31,	
				1987	1986
Boston Elevated Railway Company and Metropolitan Transit Authority debt	2020	\$1,000	6.38%	\$ 32,918	\$ 32,918
Purchase of City of Boston transit properties	2024	536	5.27	\$ 19,842	\$ 19,842
Equipment Serial Bonds	1987	127	2.90	\$	\$
	1988	131	2.90	131	131
	1993	169	3.00	1,014	1,014
	1993	100	3.20	600	600
				\$ 1,745	\$ 1,745
Construction Bonds	1988	55	3.00	\$ 2,530	\$ 2,530
	1989	70	3.60	3,274	3,274
	1990	19	3.50	912	912
	1992	50	8.75	250	250
	1993	40	3.20	2,040	2,040
	2002	575	9.31	8,625	8,625
				\$ 17,631	\$ 17,631
Total BMD Bonds payable				\$ 72,136	\$ 72,136
Total bonds payable				\$947,916	\$847,916
Less: current maturities of bonds payable				34,725	34,725
Total bonds payable, long-term				\$913,191	\$813,191

The accompanying notes are an integral part of these financial statements.

Massachusetts Bay Transportation Authority

Notes to financial statements

December 31, 1987 and 1986

Tabular amounts in thousands of dollars

primary of
significant
accounting policies

Unreimbursed cost of service The legislative act under which the Massachusetts Bay Transportation Authority (the "Authority") was established provides, among other things, that the Commonwealth of Massachusetts (the "Commonwealth") shall reimburse the Authority for its *Net cost of service*, as defined. This amount, to the extent it exceeds contract assistance (see Note 2), is then assessed by the Commonwealth to the cities and towns in the Greater Boston Metropolitan Area constituting the Authority.

The *Cost of service in excess of revenue* presented in the accompanying *Statement of revenue and cost of service* differs from the *Net cost of service* because the Authority follows generally accepted accounting principles for financial reporting purposes. For *Net cost of service* purposes, certain expenses are either not assessable, such as depreciation; or, in the instance of certain accrued costs, are not reported until paid by the Authority. The following table reconciles the Authority's *Cost of service in excess of revenue* to its *Net cost of service* as reported for the years ended December 31, 1987 and 1986:

	1987	1986
Cost of service in excess of revenue, GAAP basis	\$460,912	\$432,446
Less:		
Contract assistance from the Commonwealth	87,200	77,088
Federal and other assistance	19,876	21,593
	\$353,836	\$333,765
Expenses not reported for net cost of service purposes:		
Depreciation and amortization of deferred charges	91,044	61,467
Amortization of bond discount	874	547
Bond principal payments reimbursable by the Commonwealth	(27,396)	(25,103)
Extraordinary loss on advance refunding of debt	10,115	25,229
Interest expense paid with refunding issue on defeased debt	—	1,414
	74,637	63,554
Accrued costs for:		
Injuries and damages	—	(3,500)
Workers' compensation	365	3,200
Back pay settlement	(2,249)	—
Vacation pay earned, not taken	1,092	813
Inventory obsolescence	(543)	543
	(1,335)	1,056
Net cost of service	\$280,534	\$269,155

Change in year-end Since 1971, the Authority has operated, and its *Net cost of service* has been assessed by the Commonwealth to the cities and towns, on a calendar year basis. Legislation enacted in 1980, however, stipulated that, as of July 1, 1983, the Authority's fiscal year be changed from the calendar year to a July 1-June 30 fiscal year to coincide with the fiscal year of the Commonwealth and its cities and towns. Under other provisions of its enabling legislation, the Authority will continue to report its *Net cost of service* to the Commonwealth on a calendar year basis for reimbursement and assessment purposes.

Transportation property Transportation property is stated at historical cost. These costs include the Authority's labor costs for employees working on capital projects, related fringe benefits, and an allocated share of general and administrative costs.

Depreciation Depreciation is provided in the accounts based on the straight-line method at rates which are designed to amortize the original cost of the property in service and the depreciation rates used in 1987 are:

	Average	1987	1986
Ways and structures	2.01%	\$2,420,567	\$1,695,072
Equipment	5.74%	711,164	499,161
Land	—	130,489	90,523
Total		\$3,262,220	\$2,284,756

Massachusetts Bay Transportation Authority

Notes to financial statements/continued

December 31, 1987 and 1986

Tabular amounts in thousands of dollars

**Note 1:
Summary of
significant
accounting policies
continued**

Deferred charges Certain costs incurred by the Authority, primarily related to the expansion and modernization of its transportation system, have been deferred. These costs are amortized by charges to cost of service over the future periods in which the benefit to the Authority is estimated to be realized.

Casualty and liability costs The Authority is engaged in numerous matters of routine litigation which include tort and other claims for injuries and damages. The Authority's public liability policy in effect as of January 1, 1988 included self-insurance of \$3,000,000 per incident for bus and rapid transit. The next \$4,000,000 of coverage is shared equally between the Authority and the insurer. The Authority also carries insurance coverage above the \$7,000,000 level on a claims made basis up to a maximum limit of \$27,000,000. The \$20,000,000 layers of insurance cover bus, rapid transit and commuter rail. In May, 1988, the Authority renewed its existing program of insurance which provides for a \$5,000,000 deductible with \$2,000,000 of coverage on bus and rapid transit on a per accident basis. The \$2,000,000 layers above the \$7,000,000 were also renewed on a claims made basis up to a maximum limit of \$27,000,000. In the opinion of the General Counsel to the Authority, payments of claims by the Authority for amounts not covered by insurance, in the aggregate, are not expected to have a material, adverse effect on the accompanying financial statements.

Injuries and damages for the current year include settlements made during calendar year 1987 which were paid or agreed to subsequent to year-end.

Other cases and claims include disputes with contractors and others arising out of the Authority's capital construction program. In the opinion of the General Counsel to the Authority, amounts reasonably expected to be paid by the Authority would be within the scope of grant funds and other monies available to the Authority for the respective projects.

Workers' compensation expense The Authority is a 100% self-insurer for settlements for workers' compensation. Included in accrued liabilities in the accompanying financial statements is a reserve for estimated claims not yet paid as of year-end. The Authority includes such amounts in *Net cost of service* only to the extent that claims have been paid.

Accounting for compensated absences The Authority accrues for vested vacation pay when it is earned. The amount of vested vacation pay accrued as of December 31, 1987 and 1986 was \$13,816,000 and \$12,724,000, respectively. As a result of using the accrual basis of accounting for compensated absences, the *Cost of service in excess of revenue* was increased for calendar years 1987 and 1986 by \$1,092,000 and \$813,000, respectively.

Grants The Authority receives capital grants from certain governmental agencies to be used for various purposes connected with the planning, modernization and expansion of transportation facilities and equipment. Amortization of these grants begins when the related facilities and equipment are put into service. The grants are then amortized over the shorter of the estimated useful life of the assets or forty years. The amortization is reflected as a reduction of the unreimbursed cost of service (see Note 6).

The Authority also receives grants to fund its operating costs from the Commonwealth and the federal government (see Notes 2 and 3).

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The Authority is reimbursed for its *Net cost of service* by the Commonwealth. A portion of this reimbursement is provided specifically in the form of contract assistance for debt service. The Commonwealth assesses a portion of the *Net cost of service*, after reducing it by the reimbursement for debt service, to the cities and towns constituting the Authority, up to the legislated limit. Contract assistance for calendar years 1987 and 1986 is summarized as follows:

Debt service The legislative act authorizing the Authority to issue debt securities provides for contract assistance for the payment of annual debt service costs on bonds issued by the Authority as follows: on the bonds issued prior to January 1, 1971, the debt service is eligible for contract assistance at either 50% or 90%, as provided by contract; on bonds and bond anticipation notes issued after January 1, 1971, the debt service is eligible for contract assistance at 90%. However, regardless of when issued, contract assistance, under the current statute, will not be available on the debt service of more than \$1,120,180,000 of bonds outstanding at any one time.

Additionally, the Commonwealth pays a maximum of \$3,000,000 annually for the debt service relating to BMD debt. The Authority was eligible for contract assistance of \$74,050,000 in calendar 1987 and \$67,842,000 in calendar 1986 relating to debt service.

Operating assistance The Authority's *Net cost of service* reimbursable by the Commonwealth, after deducting the debt service and commuter rail operations contract assistance, is \$280,534,000 for calendar 1987 and \$269,155,000 for calendar 1986. The amount to be assessed by the Commonwealth for the calendar year 1987 to the cities and towns comprising the Authority is limited to \$110,171,000 which is 102½% of the amount assessed (including state borrowing charges) in calendar year 1986.

Contract assistance for commuter rail service outside the Authority's district is provided by statute each year. Contract assistance for commuter rail service amounted to \$9,585,000 in calendar 1987 and \$9,246,000 in calendar 1986 (see Note 4).

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The Surface Transportation Act of 1982 (the Surface Act) replaced previous assistance programs with a new Section 9 assistance under which both capital and operating grants are made. The Authority received \$18,810,000 of total federal operating assistance in calendar 1987 and \$20,545,000 in calendar 1986.

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Under Chapter 161A Section 3(f) of the General Laws, the Authority may enter into agreements with private transportation companies, railroads and other concerns providing for joint or cooperative operation of any mass transportation facility and for operation and use of any mass transportation facility and equipment for the account of the Authority.

On November 1, 1986, the Authority entered into a three-year operating agreement effective January 1, 1987, with the National Railroad Passenger Corporation (AMTRAK) to

provide commuter railroad service over the Authority's rail lines. The Authority has agreed to pay AMTRAK for direct and indirect expenses, on-time performance incentives (and assess penalties for poor on-time performance), and to reimburse AMTRAK for insurance and third-party liability claims.

The costs and related operating assistance of commuter rail service, excluding depreciation, are summarized below:

	1987	1986
Passenger revenues	\$23,466	\$16,216
Operating costs, excluding depreciation of Authority-owned property devoted to commuter rail service	76,823	72,688
Commuter railroad expense reflected in statement of revenue and cost of service	\$53,357	\$56,472
Less: Operating assistance from state and local sources:		
State contract assistance	(9,585)	(9,246)
Reimbursement from entities outside the Authority's area	(539)	577
Total cost, net of commuter rail operating assistance	\$43,233	\$46,649

Massachusetts Bay Transportation Authority

Notes to financial statements/continued

December 31, 1987 and 1986

Tabular amounts in thousands of dollars

Note 5: Short-term borrowings and long-term debt

Short-term borrowings outstanding as of December 31, 1987 and 1986 are as follows:

	1987	1986
Notes payable	\$235,000	\$160,000

The following notes payable were outstanding as of December 31, 1987:

Due date	Interest rate	Principal amount
March 4, 1988	4.0%	\$ 90,000
March 4, 1988	6.0%	30,000
March 4, 1988	6.3%	7,000
March 4, 1988	5.9%	8,000
September 30, 1988	6.0%	50,000
September 30, 1988	5.8%	50,000
		\$235,000

On March 4, 1988, \$135,000,000 of maturing notes were refinanced by the issuance of new notes with the same face value, carrying interest rates of 5.25% and 5.50% which mature on March 3, 1989.

Approximate annual maturities of long-term debt as of December 31, 1987 are as follows:

1988	\$ 34,725
1989	37,809
1990	36,122
1991	34,031
1992	36,574
Thereafter	779,515
Total	\$958,776

Amounts shown above represent the face amount of bonds outstanding and differ from the amounts shown on the accompanying *Balance sheet* and *Statement of bonds payable* due to the treatment of original issue discount in the accompanying financial statements as a reduction of the principal amount due.

The legislative act under which the Authority was established provides that, if at any time any principal or interest is due on any bond or note issued or assumed by the Authority and funds to pay the same are not available, the Commonwealth shall thereupon remit to the Authority the amount required to meet such obligations.

On April 15, 1986, the Authority issued \$141,760,000 of refunding bonds in order to advance refund \$67,530,000 of 1983 Series A General Transportation System Bonds and \$51,105,000 of 1983 Series A Refunding Issue of General Transportation System Bonds. The proceeds from the refunding (net of expenses) were deposited with a trustee who used the proceeds to purchase direct obligations of federal, state and local governments, thereby defeasing the refunded bonds. The government obligations will mature at such time and yield interest in such amounts so that sufficient monies will be available therefrom to pay principal and interest on the refunded debt as it matures. The refunding resulted in an accounting loss of \$25,229,000 which has been recognized as of the date of the refunding and will be charged in future years through reduced interest payments. This did not affect the Net cost of service because bond principal payments and related interest are assessed only when paid by the Authority.

The purpose of the refunding was to take advantage of the lower interest rates on the new refunding bonds, which range from 4.25% to 7.25%, as compared to the rates on the refunded bonds which range from 8.75% to 9.75%. Although a loss is recognized for accounting purposes as described above, the Authority's combined principal and interest payments on the new refunding bonds will be approximately \$4.1 million less than those payments which have been on the refunded bonds, on a present-value basis.

On March 1, 1987, the Authority issued \$122,100,000 of General Transportation System Bonds. On this issue, \$51,465,000 will be used to finance improvements in the Authority's capital improvements program. The remaining \$70,635,000 issued were refunding bonds in order to advance refund \$59,595,000 of 1985 Series A bonds. The refunding resulted in an accounting loss of approximately \$10,115,000 which was recognized as of the date of the refunding. The purpose of the refunding was the same as that described above for the April 15, 1986 refunding. The interest rates on the refunded bonds ranged from 8.10% to 8.70%, while the refunding issue ranges from 3.40% to 6.1%.

6:
and equipment
vement program

The Authority's continuing program for mass transportation development has projects in service and in various stages of

approval, planning and implementation. The following table shows estimated project costs and related funding sources:

Funding source	Projects approved	Projects pending approval	Total project costs	Expenditures through Dec. 31, 1987
Federal grants	\$2,776,000	\$ 398,000	\$3,174,000	\$2,385,000
State and local sources	178,000	20,000	198,000	156,000
Authority bonds	1,389,000	831,000	2,220,000	996,000
Total	\$4,343,000	\$1,249,000	\$5,592,000	\$3,537,000

The Authority is presently authorized by law to issue bonds, for capital purposes other than refunding, to an amount not exceeding \$1,252,180,000 outstanding at any time (this ceiling was subsequently increased to \$2.09 billion by the Massachusetts State Legislature in March, 1988) provided, however, that any bonds which mature or are redeemed on or after January 1, 1988 may not be reissued. Such bonds are outstanding as of March 16, 1988 in the amount of \$813,985,000.

The terms of the federal grant contracts require the Authority to utilize the equipment and facilities for the

purpose specified in the grant agreement, maintain these items in operation for a specified time period, which normally approximates the useful life of the equipment, and comply with the equal employment opportunity and affirmative action programs required by the Urban Mass Transportation Act of 1964, as amended. Failure to comply with these terms may jeopardize future funding and require the Authority to refund a portion of these grants to the Federal Department of Transportation. In management's opinion, no events have occurred that would result in the termination of these grants or require the refund of a significant amount of funds received under these grants.

7:
ment funds

As part of the Authority's program for mass transportation improvement, the Authority entered into a grant contract with the Urban Mass Transportation Administration (UMTA) providing for the purchase of 175 light rail vehicles, spare components and various engineering support at an estimated project cost of \$68,305,000 of which \$48,084,000 was to be provided by an UMTA grant. In 1972, the Authority entered into a contract with a manufacturer for the purchase of these vehicles, components and related engineering support. The 135 vehicles delivered pursuant to this contract experienced a variety of operating and maintenance problems which led to a series of disputes between the manufacturer and the Authority. In 1979, an agreement was reached with the manufacturer which released the manufacturer from all liability related to the vehicles in return for modification parts and a cash settlement.

UMTA has concurred with the agreement, provided that the cash settlement and associated interest income will be used along with funds remaining from the original grant to provide 175 vehicles with equivalent capacity available for revenue service. Authority management has expended and/or intends to utilize the funds as necessary in accordance with the original purposes of the 1972 grant application.

At December 31, 1987, the amount shown as settlement funds, on the accompanying balance sheet, reflects the settlement proceeds from the manufacturer plus interest realized on the proceeds since the date of the settlement less expenditures made for eligible project costs. Interest earned on the settlement funds is recorded as a deferred credit in the period during which it is earned.

Massachusetts Bay Transportation Authority

Notes to financial statements/continued

December 31, 1987 and 1986

Tabular amounts in thousands of dollars

**Note 8:
Deposits and
investments**

At December 31, 1987, deposits and investments were as follows:

	1987
Total deposits	\$ 31,846
Total investments	80,985
Total	\$112,831

Deposits and investments consisted of the following amounts presented in the *Balance sheet*:

	1987
Settlement funds	\$ 41,755
Construction funds	49,436
Federal grant and other special funds	1,407
Temporary cash investments	7,453
Cash	12,780
Total	\$112,831

A discussion of the nature of deposits and investments made during calendar 1987 and existing at year-end follows:

Deposits As of December 31, 1987, bank deposits amounted to \$31,846,000. Of this balance, \$703,000 was covered by federal depository insurance, and \$31,143,000 was uninsured and uncollateralized. The Authority's uninsured deposits ranged from \$11,900,000 to \$64,128,000 during the calendar year 1987, due to the timing of cash receipts. The uninsured amounts primarily consisted of certificates of deposit balances.

The Authority is authorized to invest in certificates of deposit with United States commercial banks. Bond proceeds funds are limited by terms of the General Bond Resolution to banks who are members of the Federal Reserve System, and deposits must not exceed 60% of the bank's capital, unless secured by certain defined instruments.

Investments As of December 31, 1987, investments in repurchase agreements were \$80,985,000 and ranged from \$38,170,000 to \$115,145,000 during the calendar year 1987. The Authority's investment balances vary due to the timing of cash receipts.

All repurchase agreements are uninsured and unregistered investments for which the securities are held by the broker agent, for the benefit of the Authority, and are not in the Authority's name. Repurchase agreements are secured by United States Government and Agency obligations.

The Authority is authorized to invest in obligations of the U.S. Treasury, agencies, and instrumentalities; commercial paper rated A-1 by Standard & Poor's Corporation or A-1 by Moody's Commercial Paper Record; bankers' acceptances and repurchase agreements secured by United States Government and Agency obligations.

The Authority provides pension benefits to employees through three contributory defined-benefit retirement plans. The largest plan, the MBTA Retirement Plan, covers all employees except MBTA Police, who are covered separately, and those executives who elect for coverage under an alternate plan (see below). The Authority contributes 14.69% of gross payroll, with the employees contributing 4.0%. Benefits accruing from the Authority's contribution vest after twenty-three years of credited service.

The amount of employee and Authority contributions to the plan is intended to fund normal cost, interest on the unfunded liability, cost of retirement benefit increases implemented in years subsequent to the years in which the benefits were earned, and administrative expenses.

Annual pension expense for the plan is computed based on a projected benefit method using a compounded annual interest rate of 7% and a salary increase factor of 5½%. The cost of the plan to the Authority was approximately \$29,138,000 for calendar 1987 and \$27,714,000 for calendar 1986. The accumulated plan benefits and plan net assets, determined as of December 31, 1986 and 1985, the latest actuarial valuations available, are as follows:

	1987	1986
Actuarial present value of accumulated plan benefits:		
Vested	\$472,573	\$460,068
Nonvested	24,197	17,211
Total	\$496,770	\$477,279
Net assets available for benefits	\$595,494	\$521,312

Employees of the MBTA Policeman Association are members of a separate contributory retirement plan. The plan requires members to contribute 4.2% with the Authority paying an amount equal to approximately 12.1% of total payroll of the members. The plan has approximately 125 members at December 31, 1987, and the cost of the plan to the Authority for calendar years ended December 31, 1987 and 1986 was approximately \$343,000 and \$399,000, respectively. The plan is not subject to actuarial valuations.

As of March 7, 1986, the MBTA offered a new pension plan for executive employees as an alternative to the MBTA Retirement Plan. The plan requires members to contribute 4% with the Authority contributing 8% of the total payroll. The plan has approximately 80 members at December 31, 1987 and the cost of the plan to the Authority was \$242,000 and \$244,000 for calendar years 1987 and 1986, respectively. Plan members vest 50% after 3 years, 75% after 4 years and 100% after 5 years of credited service. Valuation data for this plan is not available at this date.

The Authority has also entered into agreements with certain salaried employees to provide supplemental pension benefits after retirement. Employees must have at least 10 years of service and be eligible under the provisions of the contributory retirement plan to receive these benefits. At December 31, 1987, approximately 930 employees were either receiving supplemental benefits or will be eligible to receive them upon retirement. Expense under this plan is computed based upon an entry age actuarial cost method, 40-year amortization of unfunded actuarial liability, an annual interest rate assumption of 9% and a salary increase factor of 7% compounded annually. The Authority's practice under this plan is to provide a reserve for pension costs as the benefits accrue.

Supplemental benefits expense was \$1,947,000 for calendar year 1987 and \$1,832,000 for calendar year 1986. The accumulated plan benefits and plan reserves as of January 1, 1987 and 1986, the dates of the latest actuarial valuation, are as follows:

	1987	1986
Actuarial present value of accumulated plan benefits:		
Vested	\$ 9,216	\$ 9,237
Nonvested	3,760	3,449
Total	\$12,976	\$12,686
Net assets available for benefits	\$ 3,769	\$ 3,063

Additionally, the Authority is obligated to pay pension, medical and other benefits to retired employees not eligible for membership in the retirement plan. These benefits are expensed on a current (as paid) basis. The expense to provide these benefits was \$9,999,000 in calendar year 1987 and \$8,688,000 in calendar year 1986 and was recognized on a cash basis.

Massachusetts Bay Transportation Authority**Notes to financial statements/continued**

December 31, 1987 and 1986

Tabular amounts in thousands of dollars

**Note 10:
Lease obligations**

The Authority has entered into several sale-leaseback agreements with major financial institutions (the lessor) covering equipment and rolling stock. The leases expire through 2013. Upon termination of the leases, the Authority may purchase the vehicles at prices equal to the lesser of a stated percentage (40%–75%) of the lessor's original purchase price or residual fair market value, as defined.

The leases have been accounted for as operating leases under generally accepted accounting principles. Future minimum lease payments, which are eligible for 90% state contract assistance, are as follows:

Year	Amount
1988	\$ 7,843
1989	11,861
1990	11,861
1991	11,871
1992	12,261
Thereafter	252,561
Total	\$308,287

**Note 11:
Subsequent event**

On March 15, 1988, the Authority issued \$110,000,000 of General Obligation Transportation System Bonds, which will be used to finance the Authority's share of the costs of projects in the Authority's capital improvements program. These bonds carried an average true interest rate of 7.56%.

**Report of
independent
certified public
accountants**

To the Board of Directors of
Massachusetts Bay Transportation Authority:

We have examined the balance sheet and statement of bonds payable of the Massachusetts Bay Transportation Authority (a political subdivision of the Commonwealth of Massachusetts) as of December 31, 1987 and 1986 and the related statements of revenue and cost of service, unreimbursed cost of service and changes in financial position for the years then ended. Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the financial statements referred to above present fairly the financial position of the Massachusetts Bay Transportation Authority as of December 31, 1987 and 1986 and the results of its operations and the changes in its financial position for years then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

Arthur Andersen & Co.

May 6, 1988.

To His Excellency the Governor, The General Court, The Secretary of Transportation and the Advisory Board to the Massachusetts Bay Transportation Authority:

The Board of Directors of the Massachusetts Bay Transportation Authority, in accordance with the requirements of Section 5(h) of Chapter 161A of the General Laws, hereby submits the Authority's Annual Report covering operations for the calendar year 1987. Included in the report is a description of the organization, recommendations for legislation and the comprehensive program for mass transportation prepared by the Executive Office of Transportation and Construction.

The net assessable cost of service, interest charged by the State Treasurer and Boston Metropolitan District expense must be considered by the 78 cities and towns in their settlement with the Commonwealth of their 1987 accounts in November, 1988. The accounts are as follows:

	Without additional state aid	With additional aid of \$181,888,082.01
Net assessable cost of service	\$280,534,058.25	\$ 98,645,976.74
Interest charged by State Treasurer on temporary borrowings	11,524,898.00	11,524,898.00
Expense of Boston Metropolitan District	25,000.00	25,000.00
Net cost to communities	\$292,083,956.75	\$110,195,874.74

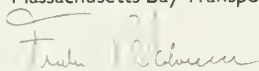
Chapter 164, Acts of 1988, the state budget for fiscal year 1989 beginning July 1, 1988, provided additional contract assistance in the amount of \$181.9 million to allow cities and towns to be capped at an assessment of \$110.2 million.

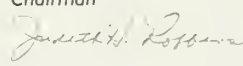
The following statement shows the Authority's comparative net cost of service including all elements of cost for calendar years 1987 and 1986.

The balance sheet and statement of long-term debt of the Massachusetts Bay Transportation Authority as of December 31, 1987, and the related statements of revenue and cost of service, reimbursed cost of service, and source of disposition of funds for the calendar year ended December 31, 1987, together with notes relating to these financial statements, are appended to this report.


Respectfully submitted,


Board of Directors
Massachusetts Bay Transportation Authority



Frederick P. Salvucci
Chairman



Judith H. Robbins


Melba F. Hamilton


William F. Irvin


James E. Smith


Scott M. Stearns, Jr.


Melissa A. Tillman

Massachusetts Bay Transportation Authority
Comparison of net cost of service—twelve month period
 Calendar years 1987 vs. 1986

		1987	1986	Increase decrease
Income	Revenue from transportation	\$110,751,992	\$106,664,373	\$ 4,087,619
	Revenue from other railway operations	5,261,131	5,909,632	(648,501)
	Non-operating income	11,617,838	11,525,196	92,642
	Gas and diesel taxes reimbursement	527,489	471,330	56,159
	Reimbursement from outside district	538,677	576,577	(37,900)
	Total income	128,697,127	125,147,108	3,550,019
Operating wages and fringe benefits	Wages	194,644,545	182,525,088	12,119,457
	General administrative cost capitalized, credit	(1,598,807)	(1,481,483)	(117,324)
	MBTA pensions	32,903,919	30,868,881	2,035,038
	Social security taxes	15,691,339	14,718,837	972,502
	Workers compensation	7,661,504	6,134,924	1,526,580
	Accident and sickness insurance	468,159	494,438	(26,279)
	Group life insurance	856,554	980,501	(123,947)
	Health care insurance	28,757,194	28,988,842	(231,648)
	Unemployment insurance	260,192	201,433	58,759
	Uniform and work clothes	898,925	788,502	110,423
	Fringe benefits cost capitalized, credit	(11,765,164)	(8,759,136)	(3,006,028)
	Total operating wages and fringe benefits	268,778,362	255,460,827	13,317,535
Other expenses and taxes	Material and other items	58,444,202	51,910,772	6,533,430
	Injuries and damages	11,811,202	8,092,407	3,718,795
	Interest on unfunded debt	7,989,029	11,030,122	(3,041,093)
	Fuel	17,160,293	16,984,480	175,813
	Taxes (other than included above)	1,064,846	1,098,747	(33,901)
	Railroad commuter subsidy	53,647,102	57,786,111	(4,138,999)
	Local service subsidies	6,268,824	4,491,104	1,777,720
	Total operating expenses and taxes	425,163,860	406,854,570	18,309,290
Fixed charges	Interest on funded debt (MTA)	4,344,800	4,638,815	(294,015)
	Interest on funded debt (MBTA)	54,219,271	51,202,364	3,016,907
	Payment on funded debt (MTA)	2,821,377	2,872,926	(51,549)
	Payment on funded debt (MBTA)	24,575,050	22,230,000	2,345,050
	Miscellaneous debits (MTA)	38,769	47,857	(9,088)
	Bank service charges (MBTA)	512,430	587,122	(74,692)
	Total fixed charges	86,511,697	81,579,084	4,932,613
	Total current expenses	511,675,556	488,433,653	23,241,903
	Cost of service in excess of income	382,978,430	363,286,544	19,691,886
Less: State and Federal assistance	Chap. 161 A of G.L. (Sec. 28)—MTA	3,000,000	3,000,000	—
	Chap. 161 A of G.L. (Sec. 28)—MBTA	71,049,864	64,841,980	6,207,884
	Chap. 140, Acts of 1985—MBTA (RR)	—	4,545,699	(4,545,699)
	Chap. 206, Acts of 1986—MBTA (RR)	4,684,675	4,700,000	(15,325)
	Chap. 199, Acts of 1987—MBTA (RR)	4,900,000	—	4,900,000
	Chap. 199, Acts of 1987—MBTA	—	168,169,211	(168,169,211)
	Chap. 164, Acts of 1988—MBTA	181,888,082	—	181,888,082
	Fed I Operating Assistance—Sec. 9	18,809,832	20,544,621	(1,734,789)
	Total assistance	284,332,453	265,801,511	18,530,942
	Net assessable cost of service—loss	\$ 98,645,977	\$ 97,485,033	\$ 1,160,944

*Note: Cities and towns capped at \$110,170,874.74 in 1987 and
 \$107,483,780.23 in 1986; Chap. 191, Acts of 1982*

The following are recommended for discussion relating to a legislative program for 1988, to be filed by November 4, 1987:

1. An Act establishing a claims and indemnity procedure for the Massachusetts Bay Transportation Authority and the officers and employees thereof.

This proposal would impose a one hundred thousand dollar limit on certain claims against the Authority. This same limitation is now applicable to the Commonwealth and cities and towns under legislation enacted in 1978.

2. An Act relative to income tax credits for employees providing all or part of certain expenses for public transportation.

This proposal would authorize a tax credit for an employer who subsidizes in whole or part prepaid transit passes or commuter rail ticket.

3. An Act providing for reduced electric power costs for the Massachusetts Bay Transportation Authority.

This proposed legislation would provide options to the Authority in obtaining the most economic source of power.

4. An Act relative to the disposal of lost, abandoned and stolen property by the Massachusetts Bay Transportation Authority Police Department.

This proposal would provide MBTA police with specific statutes for disposal of lost, abandoned and stolen property.

5. An Act establishing certain penalties for certain types of conduct on public transportation facilities.

This legislative proposal would make changes in and strengthen the laws relative to misconduct on public transportation facilities. The types of acts covered are: Throwing of missiles; fare evasion; littering; graffiti; illegal sale of passes and tokens; illegal parking; breaking and entering; disorderly conduct; and smoking. A special citation section is provided for some of the acts.

6. An Act authorizing the Massachusetts Bay Transportation Authority to transfer certain land in the Southwest Corridor in the City of Boston to the Metropolitan District Commission for park purposes.

This land is the center park land of the Southwest Corridor, which will be maintained by the MDC.

7. An Act relative to the transfer of UMass land located in the City of Boston to the Massachusetts Bay Transportation Authority.

This land is needed for the new JFK/UMass station on the Red Line.

A question frequently heard from our customers is "how is my town's MBTA assessment determined?" All 78 cities and towns in the MBTA district pay a share of the MBTA's yearly deficit or net cost of service. The assessment formulas for sharing the deficit were originally spelled out in state legislation passed in 1964 when the old MTA district, serving 14 cities and towns, was enlarged to the present regional transportation district and renamed the MBTA. The formulas have been amended by the legislature from time to time in an effort to make the assessment more fair and equitable.

The legislation defines two basic types of MBTA service, "express service" and "local service." Express service refers to rapid transit service on controlled rights-of-way, while local service refers to MBTA buses, trackless trolleys and streetcars in local streets. The net cost of providing each of these types of service is calculated separately and allocated by a different formula.

Express service Legislation has divided the assessment for the cost of express service into two parts, a 75% portion, and a 25% portion, each distributed in a different fashion. The 75% portion of the net cost of express service is shared by all 78 cities and towns in the MBTA, based on the number of "commuters" living in each municipality. The number of commuters in each city and town was determined from the 1980 Federal Census data and included all people who traveled outside their town to their place of work, whether they used public transportation or not. In the case of the City of Boston, the number of commuters was established so that Boston would be responsible for not less than 30% of this 75% portion.

The remaining 25% of the net cost of express service is shared only by those cities and town that have one or more express service stations. This part of the assessment is proportional to the number of passengers boarding the rapid transit and railroad lines at stations in each community. By law, counts are taken to determine the number of passengers boarding at each station and within each town, no less frequently than every two years. However, in 1973, the legislature amended the assessment procedure to exclude from the boarding counts passengers boarding at new rapid transit stations opened after July, 1973. This amendment means that a new station in a community will not result in an increase in its assessment for the 25% portion of express service costs.

MBTA assessment procedures
continued

Local service Local service refers to buses, trackless trolleys, and streetcars operating on local streets. As in express service, the formula for assigning the local service deficit is divided into two parts, each of 50% portions. Half of the local service deficits is allocated on the basis of population as determined by the most recent Federal Census (1980); on the weight of 14 cities and towns and 64 cities and towns independently. The other 50% is shared by those cities and towns that have such service and is based on the proportion of losses incurred in each city or town.

To determine the operating loss incurred in each community, costs are first identified with a mode of service—bus, trackless trolley and streetcar. All direct costs are identified directly with the appropriate mode, and indirect costs are allocated to modes largely based upon the direct charges to each mode each month. Costs by mode are then allocated to specific routes by means of one of six bases depending upon the type of expenses involved. Direct costs of operations and maintenance of each rating station (depot) are allocated only to routes emanating from the rating station. For example, costs of operating and maintaining routes from the Quincy Garage are allocated only to the routes in the Quincy Rating Station.

Farebox revenue is sampled on each route four times a year and the difference between operating cost and annual revenue determines the yearly profit or loss for each route. If a town elects to have no local service, buses then make stops in that town, and the profit or loss from routes passing through that town is distributed among the other towns on the route. For all cities or towns with local MBTA service, the losses and profits from the routes in the community are totalled. Half of the MBTA's local service assessment is based on the percentage of local service operating losses incurred in each municipality.

As an example of total service assessment, consider a 3-mile long bus route, with four miles in Town A and two miles in Town B. Assume that the operating cost from the route was \$100,000 a year. Assume also that farebox revenue from the route was \$40,000 a year. The operating deficit would be \$60,000 a year, the difference between operating cost and revenue. Half of this \$60,000 deficit (\$30,000) would be allocated among the 14 cities and towns and the 64 cities and towns on the basis of population, and half would be allocated to Towns A and B. Town A would have to pay \$20,000 and Town B would be assessed \$10,000 because the bus route operated twice as many miles in Town A as in Town B.

Objectives The MBTA assessment procedures can be summed up by pointing out two objectives in the formulas. The first objective is to recognize that the cities and towns of the MBTA district comprise one regional transportation district, that all municipalities benefit by the system, and therefore, all must share some of the deficit. The second objective is to assess properly that portion of the assess-

ment to those cities and towns that are receiving a greater degree of service. To relieve the burden on local government, the state began, in 1973, to pay for part of MBTA deficit. This state portion has increased because of the passage of Proposition 2½. The federal government is also providing operating subsidies for mass transit under legislation enacted in 1974, as amended.

Type of service	Portion of deficit	Who pays	Basis of assessment
Express	75%	All cities and towns	Number of communities (1980 U.S. Census)
	25%	Cities and towns with rapid transit and commuter rail	Boarding rounds (Except stations built after July 1, 1974)
Local	50%	14 cities and towns	Population (1980 U.S. census)
	50%	64 cities and towns	Share of losses sustained locally

Design

Samuel Blackmore Johnson

Major photography

John Earle

Historic photographs

Society for the Preservation

of New England Antiquities

A note on the type

This book is set in Gill Sans and Gill Sans Bold. Designed in 1928 by Eric Gill, it is modelled on the typeface his tutor, Eric Johnston, designed for the London Underground in 1916. One of the earliest of sans serif faces, it is still used for all London Transport official signs and notices.

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